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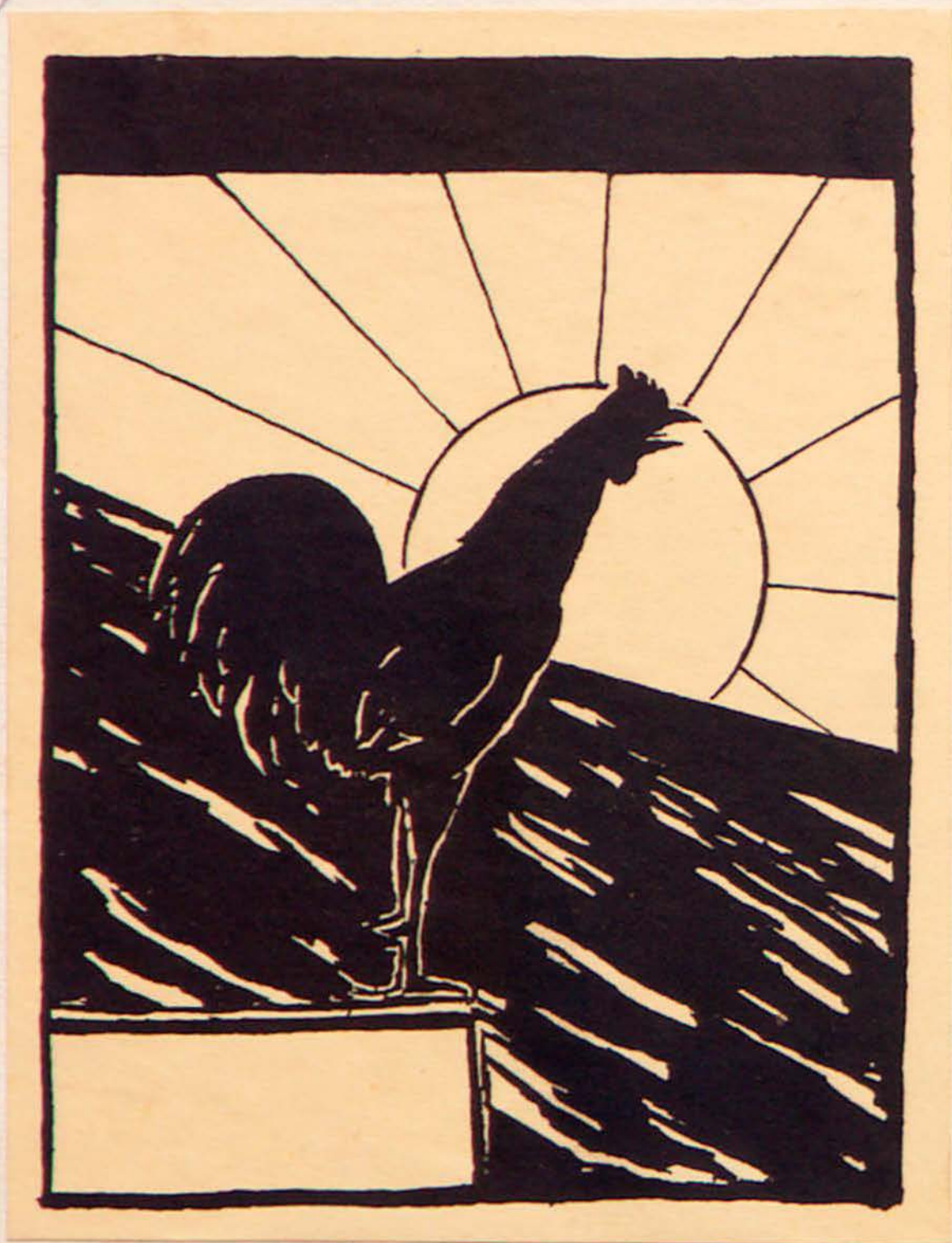
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Johnnie East



ON CHRONIC SYMMETRICAL ENLARGEMENT OF THE SALIVARY AND LACHRYMAL GLANDS.

BY WILLIAM OSLER, M.D.,

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY.

IN the second edition of my *Text-book of Medicine*, issued in 1895, under the heading of "Chronic Parotitis" I mention the case of a young girl, aged thirteen years, then under my care, "who has had for nearly a year enlargement of all the salivary glands, the lachrymal glands, the buccal mucous glands, and the spleen." The case interested me a great deal, and I searched in the literature at my disposal without finding any condition exactly like it. I had overlooked the fact that Mikulicz,¹ in 1892, had described the condition as a characterized form of chronic disease previously unrecognized. His patient, a man, aged forty-seven years, for seven months had symmetrical enlargement of the lachrymal glands, and subsequently of all the salivary glands.

Quite recently Kümmel² has met with a series of cases, and has collected one or two which had been previously described in the literature. His first case, a man, aged thirty-three years, had swelling of the salivary and both lachrymal glands in association with chronic hypertrophic rhinitis and asthma. He was cured by arsenic. The second case was a man, aged twenty-five years, who had had for two years slight swelling of all the salivary and lachrymal glands. The third case was a man, aged twenty-eight years, who had enlargement of all the salivary glands, particularly of the right parotid. The buccal and lachrymal glands were not enlarged. The fourth case, a woman, aged twenty-seven years, had swelling of both parotids and submaxillaries of two years' duration. The lachrymal glands were not involved. She had also a dry mouth. Both of these cases followed influenza. The fifth case, a man, aged forty-seven years, had swelling of both parotids only, of some years' duration. The sixth case was a woman, aged twenty-three years, in whom the submaxillary glands were swollen for six months. The other cases in the literature were the one of Mikulicz, already spoken of; one of Tietze, a male, aged thirty-six years, who for ten years had swelling of the parotid glands, and for four years swelling of the lachrymal glands. The ninth case was reported by Hallenhoff:

¹ Bruns' Beiträge (Billroth's Festschrift, 1892).

² Mittheilungen a dem Grenzgebiete der Medicin und Chirurgie, Bd. ii., 1897.

a girl, aged twelve years, had for four months enlargement of the lachrymal, parotid, and submaxillary glands. Very full abstracts of these cases are given in Kümmel's paper.

The history of the case which has been under my observation is as follows:

For more than a year enlargement of the lachrymal, salivary, and buccal mucous glands; enlargement of the spleen; syphilitic rhinitis; tuberculosis of the pleura and lungs; death. Hannah W., aged eleven years, colored, was admitted March 30, 1894, complaining of swollen glands in the neck.

Family History.—Father living, but delicate; mother died of typhoid fever. One sister has had convulsions. She has two brothers and several sisters, all of whom are healthy.



Personal History.—It is difficult to get any satisfactory account from her or her relatives. She says she has always been very well. Two years ago she had chills and fever for a month.

Present Illness.—Six weeks ago she began to feel dull and heavy, and the woman with whom she lived noticed that her face and neck were a

little swollen. She did not complain of any pain. At the same time she had slight sores in the mouth and a discharge from the nose.

I saw her on March 31st, and dictated the following note: The child is well nourished, and has a good color; the tongue is clean. The eyes are a little prominent. A remarkable feature is the symmetrical enlargement of both parotid glands, which stand out very prominently and tilt up the lobes of the ears. To the touch they are painless, and have a firm, board-like hardness. The outlines and lobulations of the glands can be felt with the greatest distinctness. The orifices of the ducts are a little swollen and firm, and a little mucus can be pressed out. Both submaxillary glands are enlarged and firm and hard. The sublingual glands can also be seen as a prominent nodular mass beneath the skin. The child's eyes are naturally prominent, but what adds strikingly to this feature is an enlargement of the lachrymal glands, causing marked bulging just above the outer canthus of each eye. They can be readily felt, and the lobulations are quite distinct. Just within the lower lip there is a small group of enlarged mucous glands. Just beyond the angle of the mouth on either side there are groups of the buccal glands, ten or twelve in number, greatly enlarged, the size of small peas. No other of the buccal glands are enlarged. The tonsils are moderately swollen. The accompanying figure, from a photograph, shows well the enlargement of the salivary glands, but not that of the lachrymal.

At the time of her admission there was no discharge from the nose. There were no signs of interstitial keratitis, and the upper central incisor teeth were well formed. There was slight general enlargement of the lymphatic glands over the body, particularly of those in the posterior cervical triangles. The spleen was enlarged; the edge could be easily felt beneath the costal border, and on deep inspiration the notch could be felt. The liver was not enlarged. The urine was of a natural yellow color, acid reaction, specific gravity 1025, and contained no albumin. The child remained under observation for more than a year. Cultures made from the mucus squeezed from the parotid ducts were negative.

Throughout the summer of 1894 the condition of the glands remained about the same. In June, before I went for my vacation, I noted that "the glands are still large and hard, without any special change." The spleen was perhaps a little smaller.

On October 1st I made the following note: "The right parotid gland is now smaller than the left. The right submaxillary and right sublingual glands are somewhat larger than they were in June. The lymph glands in the posterior cervical triangle have increased in size. The lachrymal glands have become somewhat smaller. The spleen is still to be felt nearly two fingers' breadth below the costal margin. The enlargement of the buccal glands persists." Several careful examinations of the blood were made throughout the spring and summer. The highest count of leucocytes was 10,300 per c.c. There was never any anæmia; the red blood-corpuscles were usually above normal.

In October and November she had a good deal of swelling of the nose, with elevation of the bridge, and Dr. Warfield reported that there was a good deal of thickening of the cartilaginous septum.

Throughout January and February there was distinct ulceration, which Dr. Warfield regarded as syphilitic, and she was ordered the iodide of potassium and mercurial inunctions.

In March, 1895, the right lachrymal gland became very much re-

duced in size, and was hardly perceptible. The left remained as large as previously. On March 27th she had a slight aphthous sore-throat, which was followed by an increase in the enlargement of the salivary glands, particularly of the right parotid and its extension on the cheek.

On April 6, 1895, she began to be feverish, and had pain in the right side of the chest, due to an attack of acute pleurisy with effusion. She had irregular fever through April and May. She gradually improved, and it was noticed throughout May and June that the swelling of the salivary and lachrymal glands had gradually reduced, and on July 19th it was noted that the parotid glands were no longer enlarged. The swelling of the submaxillary and sublingual glands had also disappeared, and the buccal glands were no longer to be seen.

On my return in September, 1895, I noted that there was a complete disappearance of the enlarged glands, and the spleen could only just be felt on the deepest inspiration.

The subsequent history of this case may be briefly referred to. She was readmitted to the hospital April 18, 1897, with signs of chronic pulmonary tuberculosis, with cavities at the right base. She died in July, 1897.

Dr. Livingood, who performed the autopsy, tells me that the lachrymal glands were represented by fibrous structure, and there was at the time of the autopsy no trace of any enlargement of the salivary glands.

When this case first came under observation I thought that possibly it was associated with an inherited syphilis, and this seemed to be borne out by the subsequent development of a rhinitis, regarded by Dr. Warfield as syphilitic. This opinion appeared to be borne out by the gradual disappearance of the swellings, slowly, it is true, under the use of mercury and the iodide of potassium. It is interesting to note that swelling of one or both parotids may occur in secondary syphilis, an instance of which was at that time under observation in a student. Enlargement of the spleen, as in the case here reported, is not mentioned in any of the other cases. Subsequently the question arose as to the possibility of a tuberculous affection of the glands, an idea not confirmed by the subsequent history.

Both Mikulicz and Kümmel regard the disease as a chronic infection of as yet unknown origin. The enlargement of the glands may persist for months or years; causes no general disturbance; is painless. The condition occurs, as a rule, in persons at the middle period of life. Kümmel has made a careful histological study of the enlarged glands, and finds a complete substitution of the normal tissue by leucocytes. He suggests the name *achroöcytosis*, indicating a replacement by colorless corpuscles of the glandular elements.

The condition, though not serious, is unsightly, and on this account troublesome. Arsenic seems to have been very beneficial in several cases, and should it fail, iodide of potassium should be used.

LEPROSY IN THE UNITED STATES, WITH THE REPORT OF A CASE.

BY WILLIAM OSLER, M. D.,

Professor of Medicine in the Johns Hopkins University.

*[Clinical Lecture delivered at the Johns Hopkins Hospital, Wednesday,
Feb. 2, 1898.]*

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To no disease perhaps has attention been more actively called of late years than to leprosy, one of the oldest and most dreaded scourges of the race. In great part this has been due to the activity in England of a Leprosy Commission, and to the establishment of a National Leprosy Fund. Through the energy of Dr. Lassar a Leprosy Conference has recently been held in Berlin, two volumes of the proceedings of which I pass about for your inspection. They contain an immense amount of valuable information with reference to the present status of the disease throughout the world, and the best means for its prevention.

I take this opportunity of again showing to you the case which has been in Ward I for some months, and of speaking upon the present condition of the disease in the United States and the prospects of its spreading. First let me refresh your memories about the patient before you. Her history is as follows: She is now 30 years old. She was born in Baltimore, of French-German parents; her father was a native Frenchman who came here when young; he served in the army, was a very healthy man and had no skin eruption. He died at the age of 50. Her mother, who died at the age of 40, appears to have been a healthy woman. When 16 years old the patient visited an uncle in Demerara, remaining only a few months. This uncle, a native American, is at present in Baltimore, and neither he nor any member of his family has ever had a serious skin disease. On returning to this country she lived

in Baltimore, one year in Norfolk, and for the last five years in Alleghany City, Pa. She returned to this city in April, and was admitted to the hospital as a case of obstinate lues.

Her personal history is as follows. She was healthy as a young girl; she married when 20 years old, had one child at 23, which died shortly after birth; she has had one miscarriage since. Her present illness began six years ago. Here is a photograph taken two years prior to the onset of the trouble, from which you can judge of the terrible changes the disease has wrought. She noticed first two brown spots over the elbow, and then several spots on the wrist. She was pregnant at the time, and had with their appearance a little fever and slight indisposition. These spots remained stationary until after her confinement, when they increased in size and became nodular. The disease spread rapidly, the feet being attacked next, beginning on the ankles nearly five years ago. Ever since there has been a steady appearance of lumps and nodules on the skin of the face, legs and arms. Only during the past year have they appeared above the elbows. Two years ago she lost the eyebrows and lashes; the hair of the head is not falling out. The voice began to get hoarse a few months ago, and eight months since she noticed the formation of scabs in the nose.

Her condition at present is very characteristic of tubercular leprosy. She looks a great deal older than her age; the swollen appearance of the eyebrows and cheeks, the rounded outlines of the nose and of the ears, the absence of eyelashes, and the brownish pigmented discoloration, give a picture that is perfectly characteristic. The neck is only slightly involved, showing only a few pigmented areas. The hands, feet and legs are very much involved, the hands showing scars of erosion and ulceration; the finger-nails are not attacked, but in the left hand are fresh punched-out ulcers. On the arms are scars of several very deep ulcers. On the upper arm the earlier stages are shown, the brownish discoloration, and the skin looks raised and infiltrated, and on palpation one can feel that beneath the skin there is a nodular infiltration. The forehead shows a uniform infiltration. She has little or no disturbance of sensation; she feels touch everywhere and feels pain.

She has been under our care since April last, and has improved in very many ways. The general nutrition is much better. The open ulcers and sores which were present on admission have, as you see, almost entirely healed. During the months of June, July and August she had a great deal of fever, but now for some time the temperature has been normal. She has gained in weight, and is in every way very much more comfortable. She is a very tidy, neat woman, and now is able to look after her own room. I may add that it has been to both physicians and nurses of our staff a great pleasure to be able to care for her and make her comfortable.

Where did this patient contract leprosy? You noticed in the history that she had resided in Demerara in the West Indies, a colony much afflicted with the disease. True, it is now fifteen years since she left there, and it was eight years before the first appearance of the disease. It is well known that the period of incubation may be very much longer, even as long as twenty or thirty years. It may be said that without exception all cases of leprosy met with in the Eastern States are persons who have lived for a shorter or a longer time in countries where the disease prevails. The experience in Great Britain is very instructive in this respect. Abraham estimates that within the past ten years the number of cases has been about one hundred, and so far as is known there has been but one instance in which the disease has been transmitted. This was the well known case reported by Benson, of an Irish soldier who returned from India with leprosy. His brother slept in the same bed with him for at least a year and a half, and after his death he wore the leper's clothes. Three years later the brother became leprous.

You will find in these volumes of the Transactions of the Leprosy Conference—of which by the way there is a very good abstract in Nos. 2 and 4 of the Philadelphia Medical Journal by Dr. Nuttall—a very full discussion of all the problems relating to the disease. Of these by far the most important relates to the method of infection, whether by inoculation, contagion, or hereditary transmission.

The possibility of successful inoculation must be recognized, though Hansen, the leading living expert on leprosy, declares that as yet all attempts at reproducing the disease by direct

inoculation have been unsuccessful. He does not regard Arning's experiment on the Honolulu convict as satisfactory, since this man had leprosy relatives. A number of observers, including some of the best students of the disease, have inoculated themselves with negative results. The direct hereditary transmission must be excessively rare, more so indeed than in tuberculosis. As lepers have, as a rule, very few children, heredity can only play a very small part in the spread of the disease. Alvarez stated at the recent Congress that he had never seen a new-born leper child; the youngest patient he had met with was three and a half years old.

The highly contagious character of leprosy has been a fixed belief for centuries, and much of the popular dread is based upon the highly colored views as to the extreme risk of contact with the disease. For a full discussion of the question I must refer you to the Proceedings of the recent Congress. The opinion was universally in favor of its contagious nature, though the greatest difference of opinion existed as to the methods by which the disease is conveyed, and on this question we really need much more information. An important point was brought out at the Congress as to the much more widespread distribution of the lepra bacilli, particularly in the secretions. In modern times one of the strongest points in favor of the contagious nature of the disease is the manner in which it has spread in the Sandwich Islands. Europeans residing in leprosy regions occasionally contract the disease, and with scarcely an exception, as in the patient I have just shown you, cases occurring in leprosy-free regions have a history of a residence for a longer or shorter time in localities in which the disease prevails. On the other hand there are a great many facts which would indicate that it is very difficult to catch the disease. It is true that Father Damien at the leper settlement at Molokai, and Father Boglioli (whose portrait I here show you) in New Orleans, contracted the disease in the discharge of their ministerial duties, but it has been the almost universal experience in the leper settlements and lazarettos that the nurses, physicians and attendants are not attacked. At the Tracadie settlement, which I visited a few years ago, the head Sister told me that during the forty years no Sister or servant had contracted the disease, though

the accommodations are rather contracted. Not one of the Sisters who have nursed in the Trinidad Asylum, for now nearly thirty years, has contracted the disease.

A very important question is whether there is any possibility that leprosy will again spread in the more civilized districts of the earth. A good deal of uneasiness has been fostered by sensational newspaper reports. The practical question for us here is, is leprosy spreading in the United States? I have here letters from most of the infected districts, the contents of which I will briefly summarize. Including the two districts in the Dominion of Canada, there may be said to be five foci in which the disease at present prevails. In the northern part of New Brunswick leprosy has existed in a couple of counties since the early part of the century. The cases as recognized are segregated in the lazaretto at Tracadie. Dr. Smith, the physician in charge, writes under date of January 17, 1898: "The number at present in the hospital is twenty-four, eighteen males and six females. . . . Of the above number three are Icelanders whom I brought from Manitoba. Leprosy in Cape Breton has almost died out. With us in New Brunswick segregation is stamping out the disease. The cases have dwindled from about forty in the early history of the disease to about half that number. One of our inmates is a negro I brought recently from St. John, N. B. He had strayed from Bermuda. Leprosy is not on the increase in Canada." In British Columbia the disease has been introduced by the Chinese, but I have recently heard from Dr. Hannington, of Victoria, that there are only eight cases at present in the settlement on Darcy Island. Dr. Hannington does not think that the disease is spreading. Among the Icelandic immigrants in Manitoba there are a few cases, but the strong probability is that it will gradually die out.

In the United States there are three important centres. To "New Scandinavia," as parts of Minnesota and Wisconsin have been called, the disease was introduced by the immigrant Swedes and Norwegians. Altogether more than 150 cases were known. The disease has not spread, and Dr. Bracken, the Secretary of the State Board of Health, wrote January 19, 1898, that there are in Minnesota, so far as is known, only twenty-seven cases, and some of these have probably died since

the last return. All of them contracted the disease before coming to America. A very encouraging fact is that no instance of leprosy has been known to be contracted from any of these Norwegian settlers. In California leprosy has been introduced by the Chinese, and in a few instances by native Americans returning with the disease from the Sandwich Islands. The total number of cases, however, is not large, certainly not more than a dozen, and the likelihood of the disease progressing in the native American population is very slight.

By far the most extensive focus of leprosy is in Louisiana. Dr. Isadore Dyer, who was the delegate from Louisiana to the Leprosy Conference in Berlin, has reported fully on the history of the disease in that State, where it has been known since 1785. Dr. Dyer writes under date of January 12, 1898: "My paper on endemic leprosy in Louisiana, read before the Lepra Conference in Berlin, has not yet been published. It is to appear in the third or fourth volume of the Transactions of this meeting. Full tables are given of all recorded leprosy in Louisiana since 1785, the existing acknowledged cases being separately tabulated. This last table contains 118 cases, in addition to which I have seen six within the past four months, making a total of 124 positive living cases to-day." Dr. Dyer thinks that this does not represent by any means all the cases, but says he believes it is quite justifiable to calculate the number of lepers in this State as not less than 300.

A few cases of leprosy are met with in Florida, South Carolina and in others of the Southern States. Now and again cases occur in the eastern cities, invariably imported, as in the patient at present in the hospital. So far as we know, with the exception of the single case recorded by Dr. I. E. Atkinson of this city, there has not been an instance in which the disease has been transmitted from one of these imported cases to a native American.

I believe the danger of the disease spreading and becoming in any way a serious menace to the country is entirely fanciful. In the question of the annexation of Hawaii the danger of leprosy has also come up. This really would not be a serious objection. I have seen a letter from Dr. Day, from Honolulu, in which he claims that the disease is progressively diminish-

ing, and that the statement made by Dr. Prince A. Morrow, of New York, that every one in ten individuals in the Sandwich Islands is leprous is entirely unwarranted. He quotes figures to show that the number of cases segregated in Molokai has progressively diminished in the past few years. In a recent letter to the San Francisco *Chronicle* the President of the Board of Health states that barely one per cent of the population of the Sandwich Islands has leprosy.

The means for combating the spread of the disease are perfectly plain and well understood. The Norwegian method of segregation should be enforced in Louisiana and in the State of California. Remarkable results have followed this plan. In 1856 there were nearly 3000 lepers in Norway; now there are not more than 700, and most of them are in asylums. The segregation should be compulsory in all instances except when the friends can show that they have ample provision in their own home for the complete separation and proper care of the patient.

In the case of the patient you have just seen, as her husband is not in a position to look after her, it is the duty of the city to care for her in a proper way. She should be removed to Bay View, where a room should be provided with a separate arrangement for washing the clothes and disinfecting the body linen. From a humanitarian standpoint we have been very glad to care for her and to do what we could to check the disease in its active and progressive state. Now that she has improved so much I feel that we are no longer bound to keep her, and as she is a free agent, I shall take an early opportunity to discharge her from my care.

AN ACUTE MYXŒDEMATOUS CONDITION, WITH
TACHYCARDIA, GLYCOSURIA, MELÆNA, MANIA,
AND DEATH.*

BY WILLIAM OSLER, M.D.,

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Acute myxœdema may occur as a transient condition in goitre. In 1892, I reported the case of a young man, aged twenty-three, who had a goitre of moderate size, with which was associated for a period of five or six months a myxœdematous condition of the hands and face, which disappeared completely.

In 1893, I was consulted by Mrs. B., aged thirty-seven, who had exophthalmic goitre, and a swollen, myxœdematous state of the subcutaneous tissues of the legs below the knees. They did not pit; it was a brawny induration which had persisted for several months; there was no change in color. There are a good many observations in the literature of the co-existence of the two disorders, or of the development in myxœdema (sometimes following the use of thyroid gland extract) of the phenomena of Graves' disease, or vice versa. A brief summary of the recorded cases is found in Möbius' monograph in "Nothnagel's Specielle Pathologie und Therapie" (Vol. XXII, 1896).

The cases of Sollier¹ illustrate the usual sequence. A woman, aged thirty-one, seen first in March, 1891, had had

*Read at the twenty-fourth annual meeting of the American Neurological Association, May, 1898.

¹Sollier: *Revue de Méd.*, 1891.

exophthalmos in January, 1890, without enlargement of the thyroid, but with much nervousness, pallor, tachycardia, and well-marked tremor. There was in addition a very pronounced myxœdematous swelling of the face, neck, and extremities, and supraclavicular fossæ. The thyroid gland was not enlarged, but seemed rather atrophied. In the second case, a woman, aged thirty-nine, who had had a good deal of mental worry and trouble, presented all the characteristic features of Graves' disease without goitre. The lobes of the gland could not be felt. The earliest symptoms were associated with rheumatic pains in the limbs and a transient œdema. There was much disability, and she was treated for chronic rheumatism. When admitted she presented the characteristic features of advanced myxœdema with enormous infiltration of the subcutaneous tissues. There was slight exophthalmos; pulse 110 to 120, and well-marked tremor.

I can find no description of a group of symptoms similar to that presented in the following record.

February 25, 1897. I saw to-day with Dr. Ellis, of Elkton, Mr. P., aged 31, an assistant freight manager on a western railroad.

Family history. There was no special tendency to nervous troubles. His father had been a dissipated man; his mother was living and well.

Personal history. He had enjoyed excellent health; had been very vigorous and strong. He was a man of exemplary habits; had not had syphilis, and had not been addicted to drink. He had been a very hard worker, and had been promoted rapidly to a very responsible position. He was married in 1892. He was a man of medium height, about five feet, eight, and his usual weight was 145 pounds. A photograph taken three or four years ago showed rather a thin-faced man.

Present illness. In October, 1896, his wife noticed that he was increasing rapidly in size, and before Christmas he had to get a completely new outfit of underclothes and outer garments. His weight, which as stated, was about 145 pounds, increased by January 1, 1897, to 182 pounds. He got very large in the abdomen, so much so that he suspected that he had dropsy, and in December remarkable scars appeared in the skin of the flanks. He felt pretty well and was able to attend to his work. His color was good, but every one remarked on the extraordinary increase in his size, and a personal friend asked him if he had been drinking, as he looked so bloated. He was at this time overworked, and his wife states that he became rather sleepless and irritable, and his usual disposition became changed. On and off, between

October and January, he had attacks of diarrhœa; the stools were sometimes dark colored, and he thinks there was blood in them. The movements were sometimes large and came on very abruptly, and once he had an almost involuntary evacuation. It is not altogether clear, however, that he actually at this time did pass blood. After the New Year he did not feel so well, complained of a good deal of prostration and weakness, and once he fell on the sidewalk from weakness. He kept at work, however, until February 5, when his friends insisted that he should go away for a change. He evidently could not at this time have felt very seriously ill, for he had a great deal of heavy business on hand, and worked up to three hours before leaving. He went to Florida, and while there became very much worse. He grew restless, wandered about a great deal, was sleepless, and got very "queer in his head." His wife said that he had certain delusions, said very funny things, and had an idea that people were troubling him. He said once that he would be all right "if he could get rid of these people." His skin had been very dry and harsh, and sometime in January, a red rash appeared on the upper part of the chest. In Florida he became so much worse, that he decided to return at once to Elkton, where his people lived. He arrived there on the 13th, and Dr. Ellis, who had known him from boyhood, states that he never was more shocked in his life than to see his condition. He was bloated; the face was almost purple, and he looked like a man who had been on a debauch for a month. He thought too that his eyes were a little prominent.

When I saw him on February 25, the patient was in bed, where he had remained since the 13th. He had improved in some ways, and Dr. Ellis thought his face had become very much less swollen. His mind had become perfectly clear, and he had no delusions. The features looked very heavy and bloated and congested; the lips were red, the cheeks flushed; the eyes looked a little prominent, the conjunctivæ were injected and watery. The eyelids covered the whites of the eyes; there was no Graefe's sign, no retraction of the lids, and the power of convergence was unimpaired. The tongue was slightly furred; the gums were natural looking. The neck looked thick and brawny; the supraclavicular pads were large and the lower part of the sternal notch was obliterated. Pulsation was noted in the carotids. The neck was flat in front, no prominence in the region of the thyroid, and the gland could not be felt.

On inspection of the thorax the skin looked congested and reddened in the upper part of the sternum, and there were the brownish scars of a rash in the upper part of the front of the chest.

The abdomen was full and large, and the skin presented in crescentic lines on either side in the flanks and in the iliac regions the most extraordinary atrophic lineæ, six on either side, the largest one extending in a curved line from near the tip of the tenth costal cartilage to within an inch of the spine of the pubes. It was fully three-fourths of an inch in breadth at its widest part. All were curved, and presented a purplish red color. The thighs and legs were large, but symmetrical. The skin looked everywhere dry, particularly on the backs of the hands and on the feet, and in the former situation looked infiltrated. While he was bloated and puffy, the general appearance was not at all that of a case of myxœdema.

There was not the slightest pallor or muddy hue of the skin. On palpation there was nowhere any tumor. The skin felt infiltrated and firm, and had to be picked up in large pieces, particularly over the backs of the hands and over the cheeks, everywhere a very solid infiltration. Over the manubrium and the lower cervical regions the infiltration was particularly marked.

The thyroid gland could not be well felt. If anything it was diminished in size. There was no enlargement in any of the groups of lymphatic glands.

When he arrived in Elkton, Dr. Ellis noticed the rapid action of the heart, and since then the pulse rate had not been under 120. The heart sounds were clear; there was no bruit at the base. The apex beat could be seen and felt a little outside the mammillary line. There seemed a little increase in the transverse area of dulness. Percussion over the manubrium was clear. The spleen was not enlarged. It was difficult to make a careful palpation of the liver. It was thought at first that perhaps the left lobe was enlarged, but on subsequent examination I think it was perhaps the serrations of the left rectus. Percussion gave no increase in the area of liver dulness.

The appetite had been good, and he had had no nausea, no vomiting.

After arriving in Elkton he had had on several occasions passages of blood, sometimes it was rather watery, no clots. He had sometimes as many as three and four stools in the day.

A special feature was the increasing weakness. Getting out of bed prostrated him very much, and he even had difficulty in sitting up, he felt so weak. There was a slight fine tremor of the fingers when the hands were held out, but I could not be certain that it was more than might be expected in a man who had become feeble and weak. There seemed no disturbance of sensation anywhere. The knee-jerks were present. From the time of his arrival in Elkton there had been

no sign of any mental disturbance. He seemed at times a little dull and apathetic, but the delusions had disappeared. He passed rather more urine than normal, but it contained neither albumin nor casts. His temperature was normal; during October and November his wife said that he constantly complained of feeling hot and flushed.

As I had seen this patient only at night, I visited him on March 1, in order to see the condition by daylight. The congested appearance of the face, the flushing of the skin of the chest on exposure, and the rapid pulse were very striking. On the other hand he had become apathetic and stolid. The eyes could scarcely be called prominent. The face looked very full and congested. The pulse had become more rapid, was 132 to 136, and occasionally dropped a beat. He had been sleeping very well at night, and he remained quite rational. Dr. Ellis thought that the weakness had increased considerably. He could no longer get up to use the commode. He had one involuntary passage. He had passed nearly eighty ounces of urine within fifteen or sixteen hours. The examination of it showed: deep yellow color, clear, no apparent precipitate; acid; 1.029; very large quantity of albumin; sugar present, reduces Fehling's and Mylander's solutions; polariscope, rays rotated to right indicating 2.5 per cent.; only a few finely granular casts, and a few squamous epithelial cells. There were still three or four stools in the day, usually thin and blood stained.

In a letter from Dr. Ellis, March 3, he states that the polyuria had persisted. The temperature had risen suddenly and had kept between 103° and 103.5° . He had become actively, even violently, delirious. The pulse continued with undiminished, indeed increasing, frequency. There was still blood in the stools. The most remarkable feature was the rapid diminution of the infiltration of the skin.

March 4. I saw the patient this morning. Dr. Ellis tells me that he began the thyroid extract on Monday, and continued it until Tuesday night, when the maniacal symptoms developed. He took in all twenty-five grains. Last night he had a combination of chloral and sulfonal and was much quieter, slept five or six hours. Throughout Tuesday night and the greater part of Wednesday he was in a very excited condition, using shocking language and making attempts to get out of bed, which he was really too weak to effect. The change in the patient since I saw him on Monday was very remarkable. He had become much thinner. The bloated infiltrated condition of the skin of the face and neck and upper part of the chest had lessened very greatly. There was not the same bloated aspect about the eyes, and the conjunctivæ

were not reddened. The abdomen, too, looked smaller, and there was evidently less infiltration about the legs and arms and hands. The skin was everywhere very dry and rough. He still looked flushed about the face and neck.

The pulse was between 140 and 145, regular, and of rather better volume than yesterday. The heart impulse was forcible, outside the nipple in fifth interspace. The pupils were of medium size, reacted to light.

The mental condition was peculiar. He seemed to recognize me. He was quiet most of the time; then would do odd things, as blowing three or four times forcibly, and frequently stretching out his hands to grasp imaginary objects, or he would ask some foolish irrelevant question. He was quite docile, and took food from Dr. Ellis; with the others he was a little obstinate. There was no jactitation and the tremor was very slightly perceptible. The diarrhœa had stopped for nearly thirty-six hours. The urine had been passed involuntarily. Examination of a sample by Dr. Fitcher showed the following : Specific gravity, 1.023, large amount of albumin, moderate number of fine and coarsely granular casts, and five per cent. of sugar.

On March 7, I received a note from Dr. Ellis, stating that the patient died of exhaustion that morning at nine o'clock. The active delirium never recurred. An autopsy could not be obtained.

Briefly summarized, a healthy man, weighing 145 pounds, rapidly increased in weight during three months to 182 pounds, the features became full and bloated, and the abdomen enlarged so rapidly that it split the corium in the inguinal regions in wide crescentic lines. Attacks of diarrhœa and marked irritability of temper were the only additional symptoms of moment. On February 5 he went South, and in Florida became extremely restless and had delusions. He returned to Elkton on February 13. From this date to March 7, the day of his death, his illness may be divided into two periods. To about March 1 the infiltrated, bloated condition persisted, his mind was clear, the pulse rate was not above 120, he had slight diarrhœa, sometimes with bloody stools. From March 1, coincident with the administration of the thyroid gland extract, he rapidly diminished in weight, and by the 4th he had lost in great part the bloated, infiltrated appearance. The tachycardia was more marked, he had become excited and delirious, and he had developed since March 1 an intense glycosuria.

The clinical picture presented by this case does not conform to any one disease, but presents certain combinations of myxœdema with exophthalmic goitre. In the cases recorded

in the literature, so far as I can ascertain, the myxœdema has followed the symptoms of exophthalmic goitre at a variable period of months or years. This patient presented first the features of an acute, rapidly developing myxœdema. The increase in weight within three months was remarkable, but his appearance when I saw him first was not that of ordinary myxœdema. He had the bloated, swollen appearance of a stout man who had been drinking heavily. During the last part of his life the symptoms were those which we see in the toxæmia of acute exophthalmic goitre, viz, the tachycardia, the slight tremor, the delirium and the diarrhœa. When I saw him there was no evidence of exophthalmos, though Dr. Ellis thought that on his return to Elkton the eyes were a little prominent.

It seems most rational to suppose that in this case there was a perversion of the function of the thyroid gland, resulting in a toxæmia, which presented some of the features of myxœdema and some of Graves' disease.

ON SOME OF THE INTESTINAL FEATURES OF TYPHOID FEVER.

BY
WILLIAM OSLER, M.D.,
OF BALTIMORE.

FROM
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1898.

ON SOME OF THE INTESTINAL FEATURES OF TYPHOID FEVER.

BY WILLIAM OSLER, M.D.,

of Baltimore,

Professor of Medicine in Johns Hopkins University.

TYPHOID FEVER is a general infection with special localizations in the lymphatic tissues of the intestines, in the mesenteric glands, spleen, liver, and bone-marrow. Perhaps the most interesting advance in our knowledge is the demonstration by bacteriology of the widespread nature of the infection. So far as we know, the bacilli do not multiply and produce the poison in the intestine, but in certain tissues of its wall, and in the organs named. Within the past few years we have learned to recognize a typhoid fever without intestinal lesions.¹ I have not infrequently seen most malignant cases with but slight involvement of Peyer's patches, but never until the present year have I met with a case in which there was a general infection without involvement of the lymphatic tissues of the intestine. The case will be reported in full by Dr. Flexner, and I shall here only make a brief reference to the condition.

An old man, aged 68, was admitted October 28, 1897, complaining of shortness of breath, weakness and pain in the back. He had been a very healthy man, and had had no serious illnesses. For two months he had had loss of appetite and loss in weight. Two weeks prior to admission he had pains in the back and indigestion, was short of breath, and was very thirsty. He kept about, however, until Tuesday, the 26th, when, while undressing to go to bed, he fell over. On the following day he seemed very ill, and on the 28th he was sent to the hospital. He looked a feeble, debilitated man, and seemed to be suffering a great deal of pain, groan-

¹ See Chiari's recent paper in the *Centralblatt für Allgemeine Pathologie*.

ing with each expiration. He was dull and listless, and it was difficult to get satisfactory answers from him. The tongue was dry and thickly coated with a black fur. The pulse was 128; the temperature rose to 104° in the evening. There were signs of consolidation in the right lower lobe, with friction and tubular breathing, and we naturally thought the case was one of senile pneumonia. He had no expectoration; the leukocytes were about 15,000 per cubic millimeter. When I saw him at noon on the 29th he was unconscious. He died at 10 o'clock the next morning, forty hours after admission. The autopsy, made by Dr. Flexner, showed a pneumonia of the right lower lobe, passing into gangrene, marked swelling of the spleen, moderate swelling of the lymphatic glands, no swelling or ulceration of the solitary or agminated follicles in the intestines. Pure cultures of typhoid bacilli were obtained from the pneumonic lung, spleen and from other organs.

The severity of the symptoms of typhoid fever bears no relation to the extent or intensity of the intestinal lesions. The last fatal case in my wards a week or so ago illustrates this point very well. The patient had high fever, incessant delirium, with the most profound nervous manifestations, which persisted in spite of all measures. Post mortem the intestinal lesions were comparatively slight, but the involvement of the spleen and mesenteric lymph-glands was exceptionally severe.

Influenced by the prevalent views of the all-important nature of putrefactive or toxic changes in the bowels—views which, though largely theoretic, have influenced practice profoundly²—the purgative and antiseptic methods of treatment have of late steadily increased in favor. Many physicians now believe that the key to the situation in treating typhoid fever is to be found in the intestines, and the disease is regarded as of an enteric rather than of a systemic nature. This I believe to be wrong—wrong in the worst possible way, in principle as well as in practice. Some of us may perhaps go to the other extreme in minimizing the importance of the enteric symptoms, and in avoiding all medicines

² For a good conservative statement of the question see Herter's recent paper, *N. Y. Med. Jour.*, 1897, ii.

unless specially indicated; but it may be worth while to recall the fact that a large proportion of all cases do perfectly well without any interference with the bowels. During the year 1897 I have given special attention to the intestinal symptoms of the cases under my care, 99 in number (to December 8th). The following analysis will show how slight the enteric symptoms *may* be. The intestinal features may be grouped into those of the onset, those of the course, and certain sequelæ.

(a) SYMPTOMS OF ONSET.—*ain* in the bowels was complained of in 23 cases. It was rarely severe. In one case the symptoms on admission suggested appendicitis. The patient had only been ill one day with pains in the abdomen, and when seen by Dr. Camac at 6.30 P.M., shortly after admission, he was in great pain; the abdomen was distended, and there was marked tenderness in the right flank, with board-like resistance. The tongue was coated; the temperature was 103°. Naturally appendicitis was suspected, but on the following morning when he was seen by Dr. Cushing, though the abdomen was a little distended, there was no trace of tenderness, and the case progressed as one of ordinary typhoid fever. It has to be borne in mind that the pain may be very localized in the right iliac fossa, and there are now a number of cases on record in which the appendix has been removed in the belief that the condition was one of acute appendicitis.

Diarrhea at Onset.—In 40 cases there was looseness of the bowels or active diarrhea. In 12 of these the patients had been given by the doctor, or had taken on their own account, purgative medicine. In other instances medicines had been taken, but the patients did not know whether or not it was of a purgative nature. This probably represents too small a proportion, since in this locality the common practice prevails of giving a dose of calomel or of salts at the onset of a fever, par-

ticularly if typhoid be suspected. While gentle laxatives are not specially contra-indicated, yet I think free and active purgation at the onset of the disease is decidedly harmful, and there is truth in Graves' remark that "patients who have escaped active purgation before admission to hospital get through the disease with little or no tympanites."

(b) **INTESTINAL SYMPTOMS DURING THE COURSE.**—*Pain.* 11 of the 99 cases complained of pain in the abdomen after admission. One of these had persistent pain during the first week; one only for a single day, and one on the 27th day. In two cases the pain was severe enough to excite uneasiness. A man aged 32 (Med. No. 7626) was admitted July 26th, complaining of pain in the abdomen. After a preliminary eight or ten days of uneasy sensations he felt suddenly one evening severe pain in the epigastrium, localized, sharp and severe enough to double him up, and he was not able to lie down for four hours. The pain persisted in the epigastrium, but was not of the same intensity. He was admitted at the end of the third week of the disease and was at first quite comfortable, but at noon of August 2d he had a sudden pain in the right epigastrium. There was no chill, but there was slight distention. The pain was evidently severe, and he groaned with each expiration. It persisted throughout the day, but was not followed by any jaundice. There was never any recurrence of the pain, and the patient was discharged well. Possibly this man had cholecystitis, though there was no evidence of enlargement of the gall-bladder or of gall-stones. In the case of Mrs. H., aged 45 (Gen. No. 20,433), there was at the onset a great deal of abdominal tenderness, and for two or three days after admission great soreness on palpation, with, as she expressed it, aching, sometimes quite severe; there was no constipation. The abdominal tenderness disappeared within a couple of days.

Diarrhea.—For many years past, my practice has been not to disturb the bowels in the course of the disease. With the exception of a few doses of turpentine for tympanites, or measures directed against hemorrhage or active diarrhea, I abstain from all active interference. Occasionally, for the constipation of convalescence, I give castor-oil, but I never use the so-called intestinal antiseptics, nor do I give salts, so that my experience in this connection is worth recording from its negative value, as showing how well or how badly cases of typhoid fever do with a minimum of interference. Of the 99 cases under my care during the year, diarrhea occurred (while the patient was in hospital) in only 12 cases. In not a single instance was it severe or protracted enough to require treatment. In three of the cases it was just after admission; in two it was only for a single day. This, of course, is an exceptional experience, and illustrates how variable typhoid fever may be. In October, we had between 30 and 40 cases in the wards, many of them very severe, but not one with diarrhea. Our experience for the first six years gave looseness of the bowels in 30 per cent. of the cases, but only in 9.2 per cent. were the movements at all frequent. We prefer to use injections if the bowels are at all constipated, or we dilute the milk and increase the amount of albumin-water. My experience has been, that the cases with constipation do better than those with diarrhea.

Meteorism.—Slight distention of the abdomen was present in eight cases. In no instance was it severe, or the cause of any uneasiness. It is rarely present with constipation, and is usually an accompaniment of diarrhea. When extreme, there is no intestinal symptom, with the exception of perforation, of graver omen or more difficult to combat.

Hemorrhage.—In five cases there was hemorrhage

from the bowels, which is about the average percentage. None of the cases died. One patient had passed blood prior to admission.

There was no instance of *perforation*. This is the first year in our hospital work in which this accident has not occurred.

(c) **INTESTINAL FEATURES OF CONVALESCENCE.**—By far the most frequent and annoying is constipation, which is often the cause of a slight rise in fever, and even (according to some) of chills. The use of castor-oil or of enemata of warm sweet-oil will usually suffice to relieve it. The tendency sometimes remains as a very distressing sequela of the disease, but even when most protracted it usually passes away in the course of a year or less. A troublesome symptom, though rare, is diarrhea during convalescence. It did not occur in any of the cases this year. Usually due to persistence of ulceration in the large intestine, it may prove very intractable.

It is interesting to note that we had not a single death this year from any intestinal complications. Of the four fatal cases, one, a colored woman, died the day after a celiotomy for acute cholecystitis and peritonitis; one died of asthenia on the day after admission in the fourth week of the disease; the third case was the old man who died with a general typhoid infection without intestinal lesions. He had pneumonia with pulmonary gangrene. The fourth case died with the most profound involvement of the nervous system. None of the cases remaining in the hospital at the date of writing has any intestinal symptoms.

The most important practical question to-day relating to typhoid fever is whether we shall treat it as an intestinal disease, or as a general infection.

At present a very large majority of the profession, adopting the former view, use so-called antiseptics,

with or without purgatives. Many years ago I abandoned the carbolic acid and iodine treatment—still a favorite, I see, in some quarters—and since then I have used no measures directed either to disinfection of the bowel or to the removal of supposed irritants, etc. Calomel, mercuric chlorid, Yeo's chlorin-water, salol, creosote, guaiacol, beta-naphthol, benzo-naphthol, and the shot-gun compound of Dr. Woodbridge are now much in vogue, and this at least can be said—that they probably do no harm. Though after reading Dr. McCormick's experience of 19 instances of hemorrhage from the bowels in 100 cases of typhoid fever one has a little doubt. This, of course, may have been an accidental experience, though a treatment so active as to call for from four to eight passages in the twenty-four hours cannot escape the suspicion of having something to do with this extraordinary percentage, the highest I have been able to find in the literature. This is not the first time that the profession has had the purgative method of the treatment of typhoid fever urged upon it. Fifty years ago M. De Laroque "gained a certain Parisian notoriety by treating typhoid fever with purgatives in the morning, purgatives at noon, purgatives in the evening, and purgatives in the morning again." Bretonneau, too, one of the great students of typhoid fever, recommended saline laxatives. The Paris journals of fifty years ago are full of discussions on this question. We have possibly been too fearful of the dangers of the use of purgatives in typhoid fever. The experience of a great many men who have adopted the eliminative method of Thistle, or who have used salines and calomel freely, shows that the mortality is not materially increased over that from the ordinary symptomatic plan. My contention, however, is that they are not indicated, as it is not likely that the typhoid bacilli multiply and develop their poison to any extent in the

intestinal contents themselves. One cannot but be influenced, too, by personal experience, and our results on the non-interference plan have been (for a general hospital) very satisfactory.

I am often asked—Why have you not tried the Woodbridge treatment? As well ask why do I not use Bishop Berkeley's *Tar-water*. Any intelligent physician who reads Dr. Woodbridge's articles in the journals, or as they have been collected in his book, must be impressed,—first, with the crude, unscientific character of his work, and with the ignorance everywhere displayed of the nature of typhoid fever; and, secondly, with the persistent vaunting of a specific or cure-all for it. Dr. Woodbridge is a devoted, earnest man, who honestly believes in his plan—so did Bishop Berkeley in his—but until the presentation has been made in a very different way, I can no more accept his statements than those of any other misguided enthusiast who has been fortunate enough to have his wares exploited in the profession by a drug-house of repute. That any firm should have lent their name to this “treatment,” that they should have spread broadcast in the profession its literature, may have been good business policy, but displays a sad lack of judgment. On such a question it is much easier to keep silence than to speak one's mind frankly in what may appear an ungracious, unkindly way; but I am quite ready to express this opinion in public, since I have had so often to do it in private, in response to scores of letters from physicians in different parts of the country. To one who appreciates what those great masters, Nathan Smith, James Jackson, W. W. Gerhard, Elisha Bartlett, and Austin Flint, did in this country for the elucidation of typhoid fever, the book issued by Dr. Woodbridge is a reflection on the memory of men whose works and ways are alike our standard and our pride.

A few weeks ago, I picked up Andral's Report to the Academy of Medicine, on the treatment of typhoid fever by purgatives, written some sixty years ago. Parts of it indicate that, in certain directions, we have not made much progress. He could write to-day the sentence: "If, in fact, the pyrexia, now called in France typhoid fever, were nothing more than gastro-intestinal inflammation; if the numerous symptoms that occur in its course were only the sympathetic effects of primary irritation in the digestive canal, the therapeutic question would be one of the simplest." And, in discussing the difficulties in arriving at direct conclusions about methods of treatment, that great clinician could also say to this generation: "Hence the difficulties—too often insurmountable—which present themselves, when we try to reduce to law a therapeutic result; hence, also, the occasional necessity of being more than once compelled to leave to time—that great *teacher*—the decision of such questions."

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CEREBRO-SPINAL FEVER.

By William Osler, M.D.,

Professor of Medicine, Johns Hopkins University.

A CLINICAL LECTURE ON SEVEN CASES AT THE JOHNS HOPKINS HOSPITAL, DELIVERED BEFORE THE POST-GRADUATE CLASS, JUNE 15, 1898.

I WISH to speak to you today about "a singular and very mortal malady," to use the words of Danielson and Mann, the original observers of cerebro-spinal fever in this country. We have been much interested in studying a series of cases that have come under our observation recently, and I thought the present a fitting opportunity to review the subject while it is fresh in your minds. The history of the disease in this country is given in various works. Hirsch's "Geographical Pathology" contains a very full statement. Volume I of Joseph Jones's "Medical and Surgical Memoirs" gives in many ways the best description of the early outbreaks, unless you wish to go to the original authorities. The recent monograph by Councilman, Mallory and Wright, issued by the Massachusetts State Board of Health, descriptive of the epidemic in and about Boston, is the best modern presentation of the subject from all standpoints.

Briefly summarized, the disease has appeared in this country in four different periods. In 1806, the year after the first description of the disease in Geneva, an outbreak occurred in Medford, Mass., which was very carefully studied by Danielson and Mann. During the next twenty years there were numerous outbreaks throughout the country. One of

the early descriptions of the disease is by Dr. Williamson, who recorded an outbreak in this city in 1808. The second period dates from about 1840 to 1850. It was during this time that the disease was very thoroughly studied by Ames, of Montgomery, Ala. The third period extends from 1860 to 1874, in which there were severe local outbreaks. During the civil war there were numerous epidemics, those in the Northern army you will find referred to in the "Medical and Surgical History of the War," those of the Confederate forces are in this really extensive memoir of the disease by Joseph Jones. Since 1874 sporadic cases have occurred at intervals in different places, but there have been no extensive epidemics. In 1893 there were outbreaks in New York and Western Maryland, which were studied by Drs. Flexner and Barker, and in Boston and parts of Massachusetts there have been cases since the summer of 1896.

As an epidemic, cerebro-spinal fever presents several interesting points. The disease is never pandemic; that is, widely and extensively diffused over large areas of country, but the outbreaks are more or less localized. There is an absence of any continuous extension. Thus at present the disease lingers in Massachusetts. We have heard of cases occurring in parts of the Southern States, and we are probably here on the eve of an outbreak, and cases are reported to have occurred among the miners at Skaguay, on the way to Klondike. For years subsequent to an epidemic sporadic cases of the disease occur, and you will see year by year cerebro-spinal fever as a cause of death in the health reports of the larger Eastern cities. A majority of these cases are,

however, other forms of meningitis, or the cerebro-spinal form of typhoid fever.

Passing now to the more practical aspect of the question, let me read you brief abstracts of the histories of the seven cases which we have had under observation within the past few weeks.

Case 1.—On March 24 a colored boy, John H., aged twenty, was admitted, complaining of chills and fever. The history was very difficult to obtain, as he was incoherent. Subsequently we found out that he had been working at Hawkins's Point since August, where he had had frequent attacks of chills and fever. He worked until noon of the 21st, when he suddenly lost power in his left leg and sank to the ground. Placed on his mule he started home, but fell off several times. He states also that he lost power in both arms. This condition continued for the past three days, during which time he was not able to make a step alone. He was brought to the hospital by three men. His temperature shortly after admission was 103° .

He was a well-nourished, healthy-looking boy. There was ptosis of the right eyelid, dilatation of the pupil of the right eye, but no strabismus. The spleen was not palpable. The patient sat up with difficulty, complained of a great deal of pain in the back. He sweated profusely during the examination. The examination of the lungs was negative. There was a leucocytosis of 26,000.

On the 24th herpes were present on the lips. There was very marked stiffness of the neck and retraction of the head. The temperature during the first week was distinctly remittent, a diurnal range of from two to three degrees, the maximum between 103° and 104° .

On the 29th of March, the eighth day of his illness, Dr. Thayer obtained by lumbar puncture 40 cc. of a cloudy fluid without blood. It was sterile both on color-slips and in culture.

On the 30th and 31st the patient was very much better, the mental condition clearer. He was rational; the ptosis had disappeared, but there was still stiffness of the muscles of the neck. Between 8 P. M. on March 31 and 8 P. M. on April 1 the temperature fell from 102° to nor-

mal and remained so. He made a rapid convalescence, and left the hospital on May 12.

Case 2.—Henry T., aged twenty-three, was brought to the hospital actively delirious on April 10. There was nothing of moment in his family history.

Until April 6 the patient was well and strong. He worked on the morning of the 6th, and in the evening he had a violent shaking chill.

On the 7th he complained greatly of pains in his head and back. The temperature was 101° . He was very dull, and had a muttering delirium.

On the 8th the headache was very intense. The temperature ranged between 102° and 103° . He continued delirious on the 9th, and was brought to the hospital on the morning of the 10th.

On admission he was delirious, pupils were widely dilated; the tongue was dry and coated. The spleen could not be felt. There was no herpes. The temperature was 104° .

On the 11th the delirium continued. There was marked stiffness of the muscles of the neck, and there was a leucocytosis of 22,000. There were no rose spots, no eruption on the skin. Albumen and tube casts were present in the urine. The pupils were of medium size, reacted to light. He had had no special stomach symptoms.

On April 12 a lumbar puncture was made, and only about fifteen drops of a clear serous fluid was obtained, which was negative on cover-slips and also in culture media. The spleen was not palpable. The temperature was distinctly remittent, ranging from 100° to 102.5° and 103° .

On the 18th and 19th it was more continuous. On the 20th it dropped to 99° , and on the morning of the 21st he had a severe shaking chill, and the temperature rose to nearly 105° . The pupils were equal; the ophthalmoscopic examination showed nothing abnormal. Following the chill on the 21st the temperature fell again to 99° , and on the 22d there was a second severe chill, in which the temperature rose to nearly 105° , and fell to normal on the 23d, and the patient entered upon an uninterrupted recovery.

In this patient the sudden onset, the headache, the marked cerebral symptoms, the stiffness of the neck, the leucocytosis, which ranged from 22,000 to 28,000, and the absence of all signs of typhoid fever, the prompt recovery, suggested strongly cerebro-spinal meningitis, though the cultures were negative.

Case 3.—John G., school boy, aged eight, admitted April 21, with headache and pain in the back of the neck. His illness began five weeks ago. He was brought home one evening supported between two playmates, complaining of severe headache and pain in the back of the neck. He became delirious, and for six or seven days had high fever, retraction of the head and stiffness of the muscles of the neck, and a great deal of vomiting. These symptoms continued until admission.

He was very much emaciated, and looked as though he had been through a serious illness. The temperature was 102.5° . He still complained of headache, but seemed rational and answered questions promptly. The pupils were equal. He had signs of herpes about the septum of the nose. The spleen was not palpable. He was a little dull and heavy during the following day, and the neck seemed to be very stiff. He had a leucocytosis of 13,000. There was no Widal reaction. Two days after admission his temperature became normal and he began to improve, and got well very rapidly.

In this case the sudden onset, the marked cerebral symptoms for four or five weeks with retraction of the neck, the stiffness in which persisted after admission, and the absence of signs of typhoid, were also very suggestive of the cerebro-spinal fever. The lumbar puncture was not made in this case.

Case 4.—Wm. A., colored, aged twenty-eight, cook, admitted May 12, complaining of headache, pain and stiffness in the neck. He had been a very healthy man. The present illness began suddenly on April 14, four weeks previous to admission, with violent headache and nausea. That night he became delirious, and has been so at times ever since. For the four weeks he has had

fever, sweating, pain in the head, retraction of the head and great stiffness in the muscles of the neck. On admission the temperature was 100.5° . He was rational, but drowsy, and slow in responding to questions. He lay on the left side, with the head markedly retracted and held stiffly. It could not be pushed forward even to a very slight extent either voluntarily or passively. There was no leucocytosis; the Widal reaction was absent. The retinae and nerves were negative.

On May 13 we noted that there was marked retraction of the head, which was held very stiffly and could not be lifted from the pillow without raising the whole body. The general condition seemed to be very good; temperature was 98° . On the following morning when I saw him he seemed rational. He sat up in bed himself, but was quite unable to move his head forward. From this time on he had no fever, gained rapidly, but the uncomfortable sensation of stiffness in the neck remained as late as June 11, the time of his discharge.

These four cases had aroused our suspicions, though two of them had come in practically convalescent, and in the other two we had not been able to arrive at a positive diagnosis from the lumbar puncture. Then in rapid succession three cases were admitted about which there could be no question, and which removed any lingering doubt as to the nature of the previous cases.

Case 5.—John L. H., aged thirteen, school boy, admitted May 31, with headache, much pain, and a temperature of 103° . He had been a very healthy boy, and came of healthy stock. On May 28, 29 and 30 he felt very ill, had pain in the head and persistent vomiting. On the 30th he said that he could not see out of either eye, and there was a droop in the right eye.

On admission he was a healthy-looking and well-nourished lad; temperature 103° . He was very restless, threw his arms about and talked irrationally. There was ptosis of the right lid; the right pupil was dilated, and there was marked strabismus. The head was not retracted, but it was held stiffly. The

pulse was full and bounding, 104°. There were no changes in the retinae. There was a leucocytosis of 31,000. On June 1 his temperature rose to 105°. By lumbar puncture about 50 cc. of an opalescent fluid were obtained, which showed diplococci on cover-slips. On June 2 herpes developed on the nose, and purpuric spots appeared on the neck and chest. The temperature was remittent. It sank to 99° on the morning of the 2d, and rose throughout the day to nearly 104°. He cried out a great deal with pain in the head, and could not bear to have the neck touched or moved. When questioned he seemed perfectly rational, but when left to himself he had a wandering delirium.

On the 3d and 4th he seemed a little better. On the night of the 4th he became very much worse, very delirious, and tried to get out of bed. The pulse became more rapid; there were signs of marked bronchitis at the bases, and the leucocytosis reached nearly 45,000. He became very cyanosed, with an extraordinary fulness and pulsation of the peripheral veins. There was marked congestion and fulness of all the vessels of the retinae, but no optic neuritis. The temperature fell to sub-normal, 97°, rose on the 5th at 1 P. M. to 100°, when he died.

The report of the cultures by Mr. Knox under Dr. Flexner's supervision showed the diplococcus intracellularis. Cultures from the nose did not show any organisms.

In this case the boy died about the eleventh day of a very acute illness, and there was no question as to the nature of the trouble. The post-mortem, which most of you saw, confirmed the diagnosis. I will read you the anatomical diagnosis. Epidemic cerebro-spinal meningitis—basal and spinal exudate; acute sero-purulent ependymitis; broncho-pneumonia and bronchitis. I show you here a portion of the cord which has been preserved, and you see how completely plastered it is with the exudate.

Case 6.—Martha K., aged eight, admitted June 1 in a state of unconsciousness. She had been a very healthy child. On May 30 she had been perfectly well,

and had spent the day picking peas. On coming from the field she complained of headache, walked slowly, vomited and complained of pain in the back. At 7 P. M., when she reached home, she lay down on a bench and vomited again. She vomited also through the night. She was restless, but slept.

On the 31st she felt hot at times and cold, and slept all day, and could not walk. She had castor oil, and the bowels were moved. She was unconscious all day. There was no nose-bleeding.

On admission the temperature was 101°. She was unconscious, and the lips were dry. There were herpes at the angle of the mouth. There was marked retraction of the head and neck, but there was no pain. The spleen was not palpable. There was no rash on the skin.

On the 2d her temperature rose to above 104°. The condition remained practically the same. A turbid fluid was removed by lumbar puncture, which showed numerous diplococci. The leucocytosis has been from 20,000 to 25,000. On June 3 her condition was practically the same. The temperature was markedly remittent, dropped to 100.5° and then rose to nearly 105°. She had difficulty in swallowing; the retraction of the head was extreme, and at intervals there we. At 2 o'clock on this day an erythematous eruption was noticed over the neck. The respirations became very much increased. There were no changes in the retinae.

On June 4 she became very much worse; there was a patchy erythema on the hands; none on the trunk. The temperature rose again to nearly 105°, and she died on June 4, on the sixth day of her illness. The cultures showed the diplococcus intracellularis.

Case 7.—Edward R., aged forty-seven, admitted June 4 in a condition of active delirium. He had had a severe attack of cerebro-spinal meningitis five years ago, and he had also had pneumonia. He had been a heavy drinker. His illness began on June 2 with a chill. On the 3d he had a second chill, and became irrational, and his wife noticed the stiffness in the neck. He suffered very much with

his head, and breathed very heavily. He was very delirious all the night of the third.

On admission his face was flushed. There was visible pulsation in the vessels of the neck and Cheyne-Stokes respiration. The pupils reacted well, but were somewhat dilated. He was in a heavy stupor, breathed noisily, answered questions in a wandering way, and at once lapsed into a heavy sleep. The temperature was 102° . There was a leucocytosis of nearly 15,000.

On the morning of the 5th the temperature, which had fallen at 10 P. M. to 99° ; rose to 105.6° at noon on the 5th. There was incessant tremor and clonic movements of the hands and arms. When turned on his side the head was held somewhat backward, and the neck was decidedly stiff. There was no optic neuritis. The patient's temperature remained high from noon on the 5th to 10 P. M., then dropped to 100° at 4 A. M. on the 6th. He then became rapidly worse, was profoundly comatose, cyanosed, and there was marked opisthotonos with a great spastic condition of the thumbs.

This morning for the first time purpur was noticed, which came out in quite large spots, especially marked on the legs. By lumbar puncture 10 cc. of turbid fluid was obtained. Cover-slips showed numerous diplococci. Throughout the morning of the 6th the patient became very much worse; the respirations were more rapid and the temperature rose progressively until in the evening at 8 P. M. it reached 108° , when he died, on the seventh day of his illness.

Cultures showed very characteristic diplococci. There was no autopsy.

The cases have come from various sections of the city, no two from a single street or house. Dr. Jones, the health officer, tells me that there has been a decided increase lately in the number of deaths certified as meningitis. Dr. Stokes had given him the statistics for the six weeks ending June 15. In 1896 during this period there were thirty-seven deaths from all forms of meningitis, in 1897 twenty-six deaths, while this year there were in the six weeks seventy-one

deaths, a decided increase. Eleven of these had been certified as cerebro-spinal meningitis.

You have had an opportunity, while these early cases were in the wards, to study three other forms of meningitis, the tuberculous the so-called occlusive or posterior meningitis in a child, and that remarkable case of meningitis serosa in a woman in Ward G. Several important clinical features differentiate the meningitis of cerebro-spinal fever from these forms. In the first place, you will notice in marked contrast to the tuberculous form, the suddenness of onset in the cases. The little boy, you remember, was taken abruptly while at play, the little girl when returning from picking peas, and the first case, the colored boy, while he was at work on his mule. In Case 5 I repeatedly called your attention to the fact that though the lad was evidently very ill and quite delirious, yet he responded to questions intelligently, and evidently understood what was said to him. This was noticed in two other cases, and is very unusual in tuberculous meningitis when, as in these patients, the symptoms are pronounced. The more strictly basilar localization of the meningitis in cerebro-spinal fever accounts for the greater mental clearness. The early cases of an outbreak are always difficult to recognize, and though we had a strong suspicion as to the character of our first cases, we did not arrive at a positive conclusion until the fifth, sixth and seventh cases came under observation.

The symptoms presented by the cases were very characteristic, more particularly in all of them the stiffness of the muscles of the neck and back. The little girl, you remember, had such a degree of rigidity that the hand could be placed under the head and the whole body moved like a statue. She had also in the last day of her illness extreme opisthotonos, with aggravated stretching, extensor convulsions. In Case 7 there was almost tetanic rigidity of the muscles, and at times clonic contraction of the arms. Then in Case 4, the colored man who came in in the fourth week of the disease, though he was rational and the

fever subsided two days after admission, you will remember how stiffly his head was held, and the whole trunk could be lifted, owing to the rigidity of the neck. Early rigidity of the muscles of the neck and extreme tension and opisthotonos are very much more pronounced in cerebro-spinal fever than in any other form of meningitis. The temperature curve in these cases is of great interest. In the last three acute fatal cases it was distinctly remittent in type, and the diurnal range was often as much as two, three or even four degrees. In Case 7 the ante-mortem temperature was unusually high, 108° . You will have noted in connection with the blood the very pronounced leucocytosis in all but Case 4 (a convalescent) to 26,000 in Case 1, to 28,000 in Case 2, to 13,000 in Case 3, admitted in the fifth week, to 45,000 in Case 5, to 25,000 in Case 6, to 15,000 in Case 7.

The skin eruptions, which were so marked in the early epidemics, when the disease was indeed called petechial or spotted typhus, were not marked. In Case 5 there were a few purpuric spots about the neck and chest; in Case 6 there was an erythematous eruption about the neck and hands, and in Case 7 a purpuric eruption appeared on the legs. Herpes occurred in six of the seven cases. There is perhaps no acute fever, not excepting pneumonia, in which herpes is so frequent an accompaniment.

Of late years two points of very great moment in the diagnosis of the disease have been brought out, Quincke's lumbar puncture, which enables us now to make a comparatively early diagnosis, and the determination of the *diplococcus intracellularis* as the probable cause of the disease. The spinal puncture as recommended by Quincke is a perfectly harmless procedure. As you saw in the wards, it sometimes requires a little skill to get into the canal. Not only does it do no harm, but in some cases it seemed to be beneficial in relieving the pressure. A dry tap does not mean that meningitis is not present. In the cord from Case 5 the exudate in the meninges was of such a buttery consistency that it could not have flowed had tapping been made on the day of his death.

The *diplococcus intracellularis* was first isolated by Weichselbaum in 1887, and subsequently studied by von Jäger and others. The studies in the Boston epidemics have been of great moment, particularly those of Williams and of Wentworth in the determination of the presence of the *diplococcus* in the fluid obtained by lumbar puncture. In the thirty-five autopsies reported upon by Councilman, Mallory and Wright, the *diplococci* were found in cultures and on microscopical examination in all but four cases. In one of these they had previously been found in the fluid withdrawn by spinal puncture; two of the other cases were chronic, and in the fourth case there was a mixed infection with tuberculosis. This large percentage speaks very strongly in favor of the constant association of this organism with the disease.

We need additional careful studies on the various types of the disease. On returning to your home some of you may have opportunities of studying cases. The patients you have seen here presented the ordinary type. The fulminant form, which may kill in from twelve to twenty-four hours, has not been much studied of late, and upon it we need additional careful observations. The chronic type, too, is a very remarkable form. The only case I think we have previously had in the hospital was one of this sort, which I reported some years ago. In it the symptoms may persist for two or three months.

While the prognosis in other forms of meningitis is practically hopeless, that in cerebro-spinal fever is by no means bad for a large proportion of the cases. So far as we know, the meningitis due to the *bacillus tuberculosis* is uniformly fatal. That associated with the *streptococcus*, whether developing spontaneously or as a result of injury or ear disease, is also very fatal, and, so far as we know, recovery never occurs in the *pneumococcus* form. The death rate in cerebro-spinal fever varies greatly. Hirsch puts it from 20 to 75 per cent. Of the 111 cases collected in the monograph by Councilman, Mallory and Wright, seventy-six died, a mortality of $68\frac{1}{2}$ per cent.

The treatment of cerebro-spinal fever is not in a satisfactory state. In our first four cases the recovery, so far as one could judge, did not follow the use of any special drugs or any special plan of treatment. The appearance of the meninges, of the cord and of the base of the brain in Case 5 are not very encouraging as to any possible benefit from medicine. For the fever, sponging and other forms of hydrotherapy should be employed. An ice-cap should be placed upon the head. For the pain it is, as you saw in two of our fatal cases, necessary to give morphia, and it is very warmly recommended by both Stillé and von Ziemssen. Bichloride of mercury may be tried, and

has indeed warm advocates. The question of counter-irritation is an important one. That the profession has abandoned in great part the use of blisters is evidenced by the fact that not one of these seven cases was blistered before admission. If thought advisable, the best method is to touch along the spine lightly with the Paquelin cautery. The use of the cold to reduce the fever, the administration of opium to allay the pain, and careful feeding to support the strength of the patient constitute the extent of our therapeutics in this formidable disease.*

*As I correct this lecture an eighth case has been admitted to the wards.

The Arthritis of Cerebro-Spinal Fever

BY

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THE ARTHRITIS OF CEREBRO-SPINAL FEVER.¹

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SINCE March, 1898, eleven cases of cerebro-spinal meningitis have been admitted to the wards. The disease has been prevailing to a slight extent in the city, scarcely enough to justify the use of the term epidemic, but as this is the first opportunity we have had since the opening of the hospital to study it these few cases have been most interesting. A lecture upon seven of them, which I gave to the post-graduate class on June 15th, has already appeared in the *Maryland Medical Journal*, July 16th. To-day I wish to call your attention to a feature of the disease which was not illustrated by any of the previous cases, namely, the remarkable joint complications.

Arthritis is a very inconstant symptom. North, in his valuable "Treatise on a Malignant Epidemic commonly called Spotted Fever,"² speaking of the more unusual symptoms, mentioned "swelling, like rheumatism, of the joints." In his collection of communications from different physicians describing the early epidemics between 1806 and 1811 several of the correspondents mention inflammation of the joints, like the acute rheumatism. A more specific early statement is that given in the admirable report on the disease by Thomas Welch, James Jackson and John C. Warren, a committee appointed by the Massachusetts

¹ Clinical Lecture, Johns Hopkins Hospital, November 9, 1898.

² Treatise on a Malignant Epidemic commonly called Spotted Fever, New York, 1811, p. 15.

Medical Society in 1810. "In some cases swellings have occurred in the joints and limbs; these have been very sore to the touch, and their appearance has been compared to that of gout. The parts so affected feel as if they had been bruised. These swellings are in the smaller as well as in the larger joints, and are often of a purple color. Those on the small joints especially sometimes disappear as the disease approaches its crisis.³

In many of the carefully studied epidemics in France and Germany special attention has been paid to the joint lesions of the disease. In the recent outbreak in Boston arthritis occurred in only 6 of 111 cases.⁴

In Ward F there have been two patients with severe cerebro-spinal meningitis, in both of whom arthritis was an early and quite marked manifestation.

CASE I. *Clinical Summary.* Abrupt onset with chill; fever; delirium; stiffness of the neck; enlargement of the spleen; multiple arthritis; patchy erythema of the skin with purpura; lumbar puncture; demonstration of diplococcus intracellularis in the meningeal exudate, in the blood, and in the pus from knee-joint; death on the sixth day.

Anatomical Summary. Purulent cerebro-spinal meningitis; extensive collapse with areas of pneumonia at bases of both lungs; purulent arthritis.

At the ward class on Saturday, November 5th, in one of the small rooms behind Ward F I found Jacob B., age twenty-four years, who had been brought to the hospital the evening before in a state of delirium and unconsciousness. He was a medium sized, fairly-well nourished man, with dark features; he looked very ill. The decubitus was dorsal, with the face and

³ Medical Communications and Dissertations of the Massachusetts Medical Society, vol. ii, 1813, p. 135.

⁴ Councilman, Mallory and Wright: Report Massachusetts State Board of Health, 1898.

neck turned to the left, in which position they remained during the examination. He could not be roused. The pupils were of medium size, equal, did not react well to light, no strabismus. There was no discharge from the nose or ears. The respirations were rapid, 36 per minute, the breath foul and pungent. The pulse was 132. The lips and mucous membranes were of good color, and the tonsils and throat were free from exudation. There were no herpes. The condition which attracted most attention was that of the joints. The right wrist was swollen and puffy and a little red. The skin over the knuckles of the hand was reddened and the joints seemed a little swollen, and there was a slight erythematous swelling over one or two of the phalangeal joints. The wrist was less swollen; there was a marked reddening over the styloid process of the right ulna. Both elbows were reddened and swollen, particularly over the olecrana, and on the left side a brawny swelling extended for several inches over the triceps. The redness was very intense, the inflammation seemed superficial, and the swelling did not extend to the front of the joints. The right knee was swollen and there were purplish-red blotches over the patella. The left knee was less swollen, but presented the same blotchy erythema. There was tenderness in the calves of both legs, and while examination of the joints caused no sign of wincing, deep pressure in the right calf caused an expression of pain to pass over his face. There was blotchy redness without much swelling over the malleoli, and on the inner surfaces of both feet there were spots of purpura.

The examination of the lungs showed a decided flatness in the lower right axilla, extending into the intrascapular area, with harsh, not typically tubular, breathing, and a few crackling râles. The heart sounds

were clear. The abdomen showed no rose spots, was flat and a little tense; the spleen was enlarged and could be readily felt below the costal margin. On the evening of admission there was a leucocytosis of 17,000, which by the next morning had risen to 22,000.

While the limbs were perfectly flaccid, it was impossible to move the neck, which was so rigid that the whole trunk could be lifted by placing the hands under the head. The patient's temperature, which, on admission, was 101° , sank to 98° at 8 P.M., but had slowly risen, and at the time of examination was about 102° .

The patient's history, as obtained from the friends by Dr. Hastings, was that the illness came on rather suddenly, with a chill and nausea and vomiting, on Tuesday, the 1st, since which time he had been in bed and had fever. On Thursday night he was actively delirious. He first complained of much pain in the back of the head and neck; he had slight diarrhea, two or three movements daily, no epistaxis. When visited at his home by Dr. Hastings before admission to the hospital the delirium and stupor were marked, pulse 120, respirations 28, and there was great rigidity of the limbs.

It was evident that the patient was suffering with a very profound infection. The condition of the joints resembled that in an acute pyemia. The deep coma and the rigidity and stiffness of the neck were, however, suggestive of cerebro-spinal fever. The consolidation of the lower part of the right lung appeared to be pneumonic, but while meningeal symptoms in ordinary pneumonia are not uncommon, they are very rarely associated with stiffness of the neck or rigidity of the limbs, and arthritis is an excessively rare event. Lumbar puncture was performed by Dr. Fletcher, and

50 cubic centimetres of a turbid fluid with a few white stringy flakes was removed. Cover-slips showed diplococci resembling the diplococcus intracellularis. From the right knee about half an ounce of pus was obtained, which showed similar looking diplococci.

Throughout Saturday the patient grew progressively worse. His temperature rose to 103.5° in the evening. The leucocytes were 37,000 per cubic centimetre. The respirations increased to 60 per minute; the pulse became small and much more frequent, between 160 and 172. The right knee-joint became much more swollen, and the swelling and redness of the elbow-joints, and the metacarpo-phalangeal joints of the second and first fingers of the left hand and of the first phalangeal joint of the left ring finger were much more swollen. Both wrists were also more red. A marked change had taken place also in the lungs. The area of flatness on the right side had increased, and there was also in the subscapular region on the left side an area of flatness with distant tubular breathing. The stiffness of the neck was not so marked, and the patient moved the head about from side to side. The pupils were not irregular, and there was slight external strabismus of the left eye. Towards the evening purpuric spots appeared on the thighs, most extensive on the inner side. There was general muscular rigidity. The urine contained a large amount of albumin, the specific gravity was 1,024, and it contained many hyaline and granular casts. The symptoms progressively increased through the night, and he died at a little after ten o'clock on the 6th of November, on the morning of the sixth day of his illness. The temperature rose to 105.5° at 4 A. M., and remained above 105° until his death. Just before death the head was thrown backward by a quick contraction of the muscles, and there were movements of the limbs, particularly on the right side.

Early in the morning of the 6th there was a diffuse purple mottling of the skin of the trunk and limbs.

The condition found post mortem you see illustrated in the specimens before you. Notice over the surface of the convolutions of the brain, more particularly, too, over the sulci on the right side, a creamy, purulent exudate; the same is seen over the upper part of the cerebellum, and to a less extent over the pons and medulla. There is very little exudate in the anterior portion of the base in the region of the optic chiasm. The cord presented a slighter degree of exudate, chiefly in the upper part; it was not involved to the same extent as in some other cases which came to autopsy in the spring.

The condition of the lungs is very interesting. You will remember that at the ward class on Saturday morning there was flatness in the lower right axilla and infrascapular region, with fine crackling râles and harsh, but not definitely tubular, breathing. Corresponding to this a large part of the lower lobe was dark in color, collapsed, and to the touch there were areas of consolidation. A very similar condition developed quite rapidly in the left lower lobe, and when removed it showed the same state, very dark in color, with here and there more prominent areas, also dark, but which felt much firmer and indurated. On inflation through the bronchus this dark, airless tissue was shown to be really in a condition of collapse, though there were areas of pneumonic consolidation scattered through it. The spleen was enlarged and soft. There were no special changes in the heart, though perhaps there were a few small beads of vegetation on the aortic cusp. There was suppuration in the right knee-joint; the other joints could not be opened.

Perhaps the most remarkable feature of this case is the widespread diffusion of the diplococcus intracellu-

laris throughout the body. For the first time the organism has been isolated from the blood during life and from the joints. A full report upon this interesting aspect of the question will be given subsequently by Dr. Gwyn.

CASE II. *Clinical Summary.* Onset of illness with arthritis; continued fever; tentative diagnosis of typhoid fever; development of paraplegia; lumbar puncture; purulent meningitis; laminectomy; irrigation of the spinal membranes.

You remember that on last Wednesday, November 2d, I showed you a man from Ward F, John F., age twenty-five, a sailor, who was admitted October 29th, complaining of pain in the right hip and left ankle. He had knocked about the world a good deal, but he seemed to have escaped all serious illnesses, except an attack of gonorrhea and of syphilis in 1894. In the spring of 1897 he received an injury to the hip and was eight weeks in hospital at Shanghai. Subsequently he was in hospital for three weeks at Yokohama, and was told that he had rheumatism.

His present illness began on Wednesday, October 26th, with pain in the right ankle, which became swollen and red. The next day the left ankle, and the following day his right hip, became painful. He felt feverish, but he had no headache. He was able to walk to the hospital. On admission his temperature was 104° . There were tenderness and stiffness in the right hip-joint, without swelling or redness. The left ankle was swollen, red and very tender. There was a slight redness and tenderness of the left wrist. I need not detail to you again the general negative condition on the very complete examination made by Dr. Hastings. One feature, for which indeed I showed him specially last Wednesday, was the abundant crop of peliomata over his abdomen and thighs. Until the day

you saw him his temperature had been pretty steadily between 102° and 104° . On the 2d it fell to 100° . We were very doubtful as to the condition. He had more fever and looked much more ill than in an ordinary attack of acute rheumatism. We suspected typhoid fever. The inflammation in the ankle-joint subsided in a couple of days. A suspicious feature was that on the 31st and on November 1st he complained of a great deal of pain in the back and hips, and, as he said, all over, and he had several profuse sweats. On November 1st it was noticed that he held his head in a retracted position, but there was no stiffness of the neck muscles. He was delirious at times, but as a rule answered questions intelligently. The joint symptoms had subsided completely at this date. During the past week there have been remarkable changes. We suspected, as I said, typhoid fever, though he had no rose spots and the Widal reaction was not present. The spleen, however, was palpable and he looked very much like a patient with enteric fever.

On November 4th he had retention of urine, and he did not seem to be so well, though the temperature was lower, not above 103° , but he had delirium. There was no retraction of the head or stiffness of the neck. On the 4th, 5th and 6th he still had to be catheterized. At the examinations to this date nothing special had been noted about his legs. I remember quite well that on the 3d, when I examined the condition of the ankle and of the hip, he seemed to use the legs quite naturally. At 3.30 P. M. on the 6th, as he was being prepared for an enema, it was noticed that the legs had a very helpless appearance, and when the patient was asked to move them he could not. On further examination complete anesthesia was found as high as the level of the navel, above which there was a band six or seven centimetres in width of hyper-

esthesia. At 5 P. M. the patient was in the same condition, only the abdomen had become more full, and there was extreme tenderness. The legs were quite limp, and the patient was quite unable to move them. There was slight stiffness of the neck, most marked on trying to bend the head forward. The reflexes, superficial and deep, of the legs were absent, rectum reflex was present. At 6 P. M. lumbar puncture was performed and about two drachms of a thick, creamy, brown-tinted pus removed. It showed microscopically cells and numerous diplococci, mostly extracellular and in clumps; some of these looked very like the diplococcus intracellularis. At 9 P. M. on the same evening Dr. Cushing exposed the lower part of the cord and a thick, purulent pus was drained away, coming chiefly from the lower part. The region of the cord seen looked hyperemic. A small catheter was passed under the dura, and the membranes were irrigated with normal salt solution, with which much pus escaped. The patient stood the operation well, but there has been no change since in the condition of the paralysis. He is rational and the temperature has not been so high. The leucocytosis persists, and is to-day 30,000 per cubic centimetre.

When the spinal symptoms developed we naturally thought of cerebro-spinal fever, and it very possibly is a case of this disease. The smears taken from the spinal puncture showed some suspicious-looking diplococci, though from cultures, both at puncture and operation, there have grown the staphylococcus pyogenes aureus. There is no evident source of infection, as is usual in cases of meningitis due to the ordinary pus organisms. It is to be regretted that cultures were not made from the inflamed ankle-joints when he first came into the hospital.

The infectious arthritides, while common in some

fevers, are very rare in others. In acute rheumatic fever, the typical infectious arthritis, the nature of the poison is still unknown; it is probably specific and peculiar, and the joint lesions show little or no tendency to pus formation. The other infections differ very much indeed in the frequency with which joint complications occur. In the gonorrheal infection, the septic fevers, cerebro-spinal fever, Malta fever, dengue and scarlet fever they are common, while in measles, typhoid fever, small-pox and pneumonia they are exceedingly rare.

There are two points of special interest in these cases; first, the early onset of the arthritis. I confess that in Case II we were completely thrown off our guard. I suspected for a day or two rheumatic fever; then as the symptoms subsided and as the temperature kept up we thought possibly it might be an unusual instance of arthritis in early typhoid fever, as gonorrheal infection could be excluded.

Case I illustrates probably the maximum degree of involvement of the joint in cerebro-spinal fever. It shows, too, the rapidity and severity with which the complication may develop. When Dr. Hastings saw this man at his home on the third day of his illness the joints were sore and red and swollen.

The second point, of still greater interest, is the light which Case I throws on the nature of the infectious arthritides. The arthritis in cerebro-spinal fever brings up a question, much discussed of late years by neurologists, of the cause of the joint affections in diseases of the central nervous system. All grades — simple congestive synovitis with areas of painful redness resembling erythromelalgia, acute multiple synovitis and arthritis, extensive disorganizing suppuration of joints — are found in the acute and chronic forms of spinal cord disease. A very careful bacteriological

study should be made of these cases. The joint lesion is usually regarded as trophic in character; and I think the general view has been that in cerebro-spinal fever also the arthritis is a secondary effect of the inflammation of the cerebro-spinal meninges. In this case the separation of the specific organism from the inflamed joints and from the blood demonstrates that the joint complication may be the direct effect of a widespread diplococcus septicemia.

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In Memoriam

WILLIAM PEPPER

BY

WILLIAM OSLER, M.D.

Professor of Medicine, Johns Hopkins University

FROM

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MARCH 18, 1899

IN MEMORIAM—WILLIAM PEPPER.¹

IN *Rugby Chapel*, that noble poem in memory of his father, Matthew Arnold draws a strong contrast, on the one hand, between the average man, who eddies about, eats and drinks, chatters and loves and hates—and then dies, having striven blindly and achieved nothing; and, on the other, the strong soul tempered with fire, not like the men of the crowd, but fervent, heroic and good, the helper and friend of mankind. Dr. William Pepper, whose loss we mourn to-day, while not a Thomas Arnold, belonged to this group of strong souls, our leaders and masters, the men who make progress possible.

There are two great types of leaders; one, the great reformer, the dreamer of dreams—with aspirations completely in the van of his generation—lives often in wrath and disputations, passes through fiery ordeals, is misunderstood, and too often despised and rejected by his generation. The other, a very different type, is the leader who sees ahead of his generation, but who has the sense to walk and work in it. While not such a potent element in progress, he lives a happier life, and is more likely to see the fulfilment of his plans. Of this latter type the late Professor of Medicine at the University of Pennsylvania was a notable example—the most notable the profession of this country has offered to the world.

I.

William Pepper began life under conditions which are very often unfavorable to success. His father, a distinguished physician, the professor of medicine in the school in which his son was educated, belonged to a family of position and influence. For the young man there were none of those tempering “blows of circumstance,” no evil star with which to grapple and grow strong. Quite as much grit and a much harder climb are needed to reach distinction from the top as from the bottom of the social scale, and to rise superior to

¹ This address was prepared to be delivered at the opening of the session of the Johns Hopkins Medical School, October, 1898; but I was ill at the time.

the *res abundans domi* has taxed to the uttermost many young men in this country. We have heard enough of the self-made men, who are always on top; it is time now to encourage in America the young fellow who is unhappily born "with a silver spoon in his mouth." Like the young man in the Gospels, he is too apt to turn away sorrowfully from the battle of life, and to fritter his energies in Europe, or to go to the devil in a very ungentlemanly manner, or to become the victim of neurasthenia. To such the career I am about to sketch should prove a stimulus and an encouragement.

At the age of 21, in 1864, the year of his father's death, Pepper graduated from the Medical Department of the University of Pennsylvania, having previously taken the B A. degree. What now were the influences which sent this youngster bounding up the ladder three rungs at a time? In the first place, the elder Pepper was a clinical physician of exceptional abilities; but more than this, intellectually he was a son of the great Louis, one of that band of much loved American students, whom Louis sent to their homes with high ideals, with good methods of work, and with a devoted admiration of their chief. The talk at home while young Pepper was a medical student must often have been of the old teacher, of his ways and works, of his noble character and of his loving heart. The father's mental attitude had been moulded finally by Louis, and the son's early work shows deep traces of the same influence. Indeed all through life the clinical manner and habits of thought of the younger Pepper were much more French than English or German. In this respect he differed widely from his contemporaries who became dominated by the Vienna and Berlin Schools. Dr. Pepper, Sr., died a few months after his son's graduation, leaving him a moderate competency, and the example of a life devoted to all that was highest in our profession. It is interesting to note that the two diseases portrayed most skillfully by Louis, typhoid-fever and phthisis, were those which both the elder and the younger Pepper studied with special ardor.

For more than a century the Pennsylvania Hospital has been the nursing mother—the *pia mater*—of the kings of the clinic in Philadelphia, but in the long list of medical officers

given in Morton's history of that institution you can find no young man who made his connection with the hospital so immediately productive as William Pepper. To it I attribute the second potent factor in his rapid professional development. In the summer following his graduation he served temporarily as apothecary. In 1865 he was elected one of the resident physicians, and had as a colleague his friend, Edward Rhoads. On the completion of his service he was appointed pathologist to the Hospital and curator of the Museum, positions which he held for four years. He immediately threw all his energies into the study of morbid anatomy, and in 1868 was appointed lecturer on the subject in the University. Making autopsies, working in the Museum, studying tumors and microscopic specimens, his time could not have been more fortunately spent, for in these early years he thus obtained a knowledge of morbid anatomy which stood him in good stead when time became more precious and engagements numerous. Throughout his entire career this work lent accuracy and firmness to his diagnosis. He never forgot the value of morbid anatomy, nor the debt which he owed to it. I have known few practitioners more keen (or more successful) in obtaining permission for autopsies. Very often he would send an especially interesting specimen to my laboratory, knowing that I would gladly get it ready for his clinic. Quite early in my association with him I saw that he had served an apprenticeship in the dead-house. He could come into the clinic and pick up a heart which he had never seen, but only felt and heard, and go at once to the seat of the disease.

The descriptive catalogue of the Pathological Museum at the Pennsylvania Hospital was issued in 1869, and while a large portion was from the pen of Dr. Morton, every page bears witness to the careful and thorough manner with which Dr. Pepper had worked over the specimens. The early volumes of the Transactions of the Pathological Society attest his zeal in this study.

As the third powerful element in his progress I place his association with Dr. John Forsyth Meigs, in the revision of the well-known work, *The Diseases of Children*. The third edition had appeared in 1858. The fourth edition, by Meigs and Pepper, was practically a new work. Dr. Meigs was an

exceedingly busy man, and the bulk of the revision fell to his junior. The descriptions of disease were admirable, the pathology well up to date, and the authors broke away in a remarkable manner from many of the traditions and routines of old-time practice. If you compare Meigs and Pepper of 1870 with the third edition, or with the contemporary books on the same subject, you will see what a radical work it was for that date. To one section of the edition we may turn with special interest, namely, to diseases of the cæcum and appendix. Nowhere in literature, I believe, before 1870, is the importance of the appendix so fully recognized, or is there so good a description of the results of perforation. One cannot but regret that no edition of this work appeared after the sixth, in 1877. The experience gained by Pepper, while still a very young man, in the preparation of this work, was of incalculable value. It familiarized him with the literature, gave him an insight into the art of book-making, brought him into close personal contact with a man with remarkable medical instincts, and altogether was a circumstance which, I think, may be justly regarded as one of the three most powerful influences during the formative period of his career. Indeed, in many quarters Dr. William Pepper, Jr., as he used to be called, really never got the credit for the association with Meigs in the work on *Diseases of Children*. For years I had the impression that it was his father who was the joint author of the work; and even quite recently, since Dr. Pepper's death, I heard a man well versed in medical literature and interested in diseases of children, express great surprise that the Pepper of Meigs and Pepper was the late Provost of the University.

In 1870 *The Philadelphia Medical Times* was started, but the health of Edward Rhoads, who had been selected as editor, had failed so rapidly that the opening of the new enterprise was entrusted to his friend, William Pepper, who brought out the first twelve numbers of the journal, and then transferred the editorship to the late James H. Hutchinson. I have glanced over Vol. I, to glean indications of Pepper's early work. Among five or six contributions two are of particular interest, as they indicate the sort of work this young man was doing in clinical medicine. At page 274 is recorded a case of scirrhus of the pylorus with dilatation of the stomach,

an ordinary enough case nowadays, but one which has gone into literature and is often quoted on two counts: first, the accurate study of the peristalsis of the stomach-wall, which was visible, and made the subject of very careful electrical experiment; and, secondly, the practical point of using the stomach-tube, at that date a novel procedure, and, so far as I know, not previously practised in America in cases of the kind. The other contribution, still frequently referred to in the literature, on Progressive Muscular Atrophy of the Pseudo-hypertrophic Type, is one of the most exhaustive contributions to the subject made up to that date, and is a model of accurate clinical and anatomical study.

An advertisement in a supplement to one of the numbers gives us an idea of the sort of work he was doing at this time in teaching. In conjunction with H. C. Wood, Jr., he announces a course of practical medicine at the Philadelphia Hospital, to extend throughout the months of April, May and June. They announce that between them they have 175 patients under their care. Dr. Pepper was to meet the class at 8 A.M. on Tuesday, and Dr. Wood at 9.30 A.M. on Friday.

It seems to me that for so young a man, Pepper had a great deal of good sense to have avoided the pitfalls of medical journalism. He must have seen at an early date that to be successful in it meant practically the sacrifice of everything else.

By the end of December, 1870, young Pepper, then only a little past 27 years of age, already had a well-established reputation as a teacher and worker. I do not know of another instance in the profession in which a man at his time of life had made so favorable a start. From this date on we may divide his life into three periods,—to 1881, when he was appointed Provost of the University, his Provostship, 1881–1894, and the short period since his resignation from that office.

II.

The decade from 1871–80 demonstrated that a man of men, to use a phrase of Milton's, had arisen in the profession in Philadelphia, a man with both "*geist* and go," one who could not only blow a trumpet-blast loud enough to awaken the slumbering conservatives of his native city, but who

could command a following which enabled him in spite of all opposition to set on foot much-needed reforms. As illustrating his activity during this period, I can allude, and only briefly, to three important pieces of work. The removal of the University to West Philadelphia doubtless made her friends aware of the possibilities of the situation. In the Medical School, then a relatively much more important section, the plans had been organized for well-equipped buildings and laboratories in West Philadelphia. An exceedingly judicious plan, for which I do not know whether Pepper was solely responsible, but one in which he had his whole heart, was the organization of a hospital to be under the control of the faculty and trustees. Blockley was within a stone's throw of the new buildings of the Medical School, and its rich stores of material were available, but it was a very wise and far-seeing scheme which regarded the clinical equipment as an integral part of a medical school which should be under the immediate supervision of the faculty. For many years it was a hard struggle to make both ends meet, and even when I joined the faculty of the University in 1884, the hospital was constantly in need of funds (and much besides). One thing it never lacked, hopefulness on the part of Dr. Pepper, who never for a moment consented to look at the dark side of the picture, always saw a few years ahead, predicted success in the days when the debt was the greatest; and with many other schemes on hand he never let an opportunity slip to forward the interests of that part of the institution which he loved, perhaps, better than any other. In 1881, the Vice-Provost, in an address at the inauguration of Dr. Pepper as Provost, expressed the popular feeling as follows: "To him who has pleaded for mercy to the helpless sick, as a lover would plead his own cause; who, working with other men of goodwill, took by tacit election the headship among them; who has touched with a master hand the springs of influence—to him public esteem has given the wreath as the moral architect of our Hospital." It is gratifying to think that he lived to see it placed on a solid basis of success, with the maternity department splendidly organized, the Pepper Clinical Laboratory, which he himself gave in memory of his father, the centre for high-class work, and the new Nurses' Home and the Agnew Wing in full operation.

Were I asked to name the most satisfactory single piece of work in Dr. Pepper's life, I should say unhesitatingly that which related to the promotion of higher medical education. This little volume² contains two addresses, one delivered October 1, 1877, the other October 2, 1893. They represent a forecast and a retrospect. At the time of the removal of the University to West Philadelphia the University Faculty was a strong one, but it contained a number of men who were saturated with old-time prejudices, and who were bitterly opposed to any change in the methods of medical education. Once before, in 1846, the University had made an attempt to elevate the standard of medical education, but unsuccessfully. In 1871, the Harvard Medical Faculty had been taken in hand and reorganized, so that the example had been set, but there was probably no school in the Union in which the outlook for reform was thought to be less hopeful than at the University. The struggle was a hard one; the brunt of it fell upon the young men, more particularly upon Pepper, who was the very head and front of the new movement. The plan of reorganization was not carried without much bitterness; indeed, it looked at one time as though the faculty would split, as Professor Rogers, who did resign, very nearly carried with him several strong colleagues. As Dr. Pepper says in his second address, speaking of the inauguration of the new system in 1877: "We thought, too, alas, of the long and painful controversy, lasting almost five years, over the proposition to again elevate our standard of medical education, and of how the end had been attained only at the cost of old friendships and of the allegiance of valued associates, whose convictions remained unchanged as to the injury that would be worked to the University by the proposed advance." The movement was immediately successful, and the changes then made were but precursors to other more radical advances. It was always a source of great gratification to Pepper to feel that the plans for which he had worked so hard had been crowned with such success. Years hence these two addresses, with their appendices, will be regarded as perhaps the most valuable single contributions to the literature of the phenomenal educational move-

² Higher Medical Education; Two Addresses, by Wm. Pepper. Lippincott & Co., 1894.

ment through which we have lived during the latter quarter of this century.

The third event of which I spoke was the organization of the medical department of the Centennial Exposition of 1876. I only mention it as one which gave him an opportunity to demonstrate how strong were his executive abilities.

In 1881 Pepper was elected Provost of the University of Pennsylvania. The feeling was unanimous that he was the man in whose hands the destiny of the institution would at any rate be safe, but no one could have predicted such a decade of development as took place under his management. The material progress is indicated by an increase in the acreage in West Philadelphia, from 15 to 52; the number of students increased from 981 to 2180, and the fees of the students during the same period more than trebled. I do not know that there has been an instance of such remarkable growth in any University in this country, unless it has been in a newly established one, such as the University of Chicago. That the University to-day occupies a position in the very first rank of educational institutions is due to the energy of William Pepper.

Passing without further comment the work of his Provostship, since this has been dwelt upon with great fulness in various obituary notices, I may here refer to several important undertakings during this period. There had never been published in this country a composite work by native writers, corresponding to the *System of Medicine* by Reynolds or to *Ziemssen's Encyclopædia*. A circular was issued in November, 1881, to the joint authors, but it was more than three years subsequently before the first volume of the system was issued; the five volumes were then published in rapid succession, the fifth appearing in 1886. While unequal, as all such systems must necessarily be, it remains a great work, and contains articles which have become classical in American literature. It proved to be perhaps the most successful literary venture ever made in this country by a medical publishing company, and it extended widely the reputation of the editor.

For many years those of us whose work lay in the special field of medicine had felt that a society was needed in which

we could meet our fellows in the same line of work. As early as 1881 I had written to Dr. Tyson, shortly after my first visit to Philadelphia, urging the organization of such a body, but it was not until the winter of 1885-86 that the initial steps were taken to form the "Association of American Physicians." I remember well in the preliminary meetings how by tacit consent Dr. Pepper assumed the headship, and in formulating the details and in arranging the final organization his executive abilities made the work very easy.

A few years later a much more difficult scheme was engineered by him to a successful issue in the welding of the various special societies into the Triennial Congress of American Physicians and Surgeons. Much of the success of the first meeting in 1888 was due to the admirable manner in which, as Chairman of the Executive Committee, he shaped the policy of the organization. One astonishing feature in his character was the intense energy and enthusiasm with which he threw himself into these and similar schemes. Letters of suggestion here, of advice in another quarter, conferences, caucuses,—as if, indeed, he had nothing else on his mind, nothing to do but the business on hand. He always appeared at a meeting prepared, knowing exactly what was needed, and, as I have said, taking the headship by tacit consent, the business was "put through" in a way not always seen in gatherings of medical men.

For many years Dr. Pepper had advocated a closer union between the United States and the Latin-American republics, the commercial and intellectual relations of which he maintained should be with this country rather than with Europe. Practical expression to the conviction he gave on organizing the first Pan-American Medical Congress (of which he was President), and in interesting the governments of the South American States in his Commercial Museum.

Though a chief promoter both of the Association of American Physicians and of the Congress of American Physicians and Surgeons, he was a warm advocate of the claims of the National Association, the meetings of which he very often attended, and in the success of which he was deeply interested. Of late years the extraordinary calls upon his time made attendance upon medical societies very difficult, and more than once he has expressed to me his deep regret that

unavoidable engagements either prevented it altogether or made his visits hurried and unsatisfactory.

For some years before his formal resignation of the Provostship, Dr. Pepper had felt that he had done as much as any one man could, and that it was in the interest of the University that he should give way to someone else. It was his hope, I know, to be able to resign at the end of his ten years' service, but circumstances delayed his action until 1894.

But it was not for rest, or for any warning that he was doing too much, that he asked to be relieved from the cares of the University. Other great schemes had been absorbing his energies. For years he had been impressed with the importance of museums and collections. The Wistar Museum of Anatomy had been a source of great satisfaction. In 1891 he undertook the establishment of the Archæological and Palæontological Museums. The strong personal interest which he took in Archæology encouraged his friends to hope that he had at last found a hobby which might divert him from more trying duties. He could talk on the outlook in Babylonia, button-holing some local Dives, and impressing him with the needs of their last University expedition, as though he had no other interest in life. To the next man it was of the wonderful "finds" in Florida or Peru, and of their great importance in the history of the early races of this continent. It was extraordinary how he could warm up in talking of these and allied subjects, and his quick, receptive mind and retentive memory enabled him to grasp the important points in the problems to be attacked.

For a quarter of a century he devoted his marvellous energies to the University of Pennsylvania, believing that in serving her he could best serve his city and State. The last years of his life were given to promote the material and intellectual welfare of his native town. The success of the museum schemes gave courage to his ambition, and he began the organization of the Commercial and Economic Museum, of which he was president at the time of his death. His desire was to see about the University of Pennsylvania a great group of museums which would not only illustrate the past and present history of man in all his relations, but which would reflect the commercial and economic aspect of

his present activities, and particularly one in which the raw and manufactured products of the world would be represented, a place in which the business man of Pennsylvania could be put in touch with producer or consumer in any country. An immense scheme, involving millions of dollars, it has advanced to a stage in which not only is success assured, but in which people are beginning to appreciate what a boon has been bestowed on a great manufacturing city.

And then, as if such a colossal enterprise were not sufficient to keep him busy, he undertook the organization of a Free Library for Philadelphia. It was no doubt through his influence that his uncle had given a quarter of a million dollars for the purpose. This library was very near to his heart, and its remarkable success in so short a time was, he has told me, a source of the keenest pride. Not long before his death he secured a bequest of a million dollars for a public art-gallery.

From this hurried sketch you may get an idea of the ceaseless energy and activity of his life, but it would be very incomplete without some specific reference to his work as a practising physician. The medical profession in every country has produced men of affairs of the first rank, men who have risen high in the councils of nations, but with scarcely an exception the practice of medicine has not been compatible with such duties. So absorbing are the cares of the general practitioner or the successful consultant, that he has but little time to mingle in outside affairs, and the few who enter public life do so with many backward glances at the consulting-room, and with well-grounded forebodings of disaster to professional work. But Dr. Pepper maintained to the end the closest relations with the profession, both as a consultant and a teacher. To me one of the most remarkable features of his life is the conscientiousness with which he attended to a large and exacting practice. That amid such multifarious cares and duties he should have been able to maintain an undiminished activity in his calling is perhaps the greatest tribute to his genius. As a teacher his forte was in the amphitheatre, where he displayed precision in diagnosis, great lucidity in the presentation of a complicated case, and a judicious and thorough knowledge of the resources of our art.

Naturally, as he became more and more involved in outside affairs, he became less able to contribute important papers to medical literature, but a glance through the files of the *American Journal of the Medical Sciences*, and the *Transactions of the Association of American Physicians* show during the past ten years a large number of very valuable contributions, many of them in collaboration with younger men. The journal literature of the same period is full of more ephemeral contributions in the form of clinical lectures.

I have already referred to several important early contributions. Among others of special importance I may mention his studies on pernicious anemia, the first made, I believe, by any physician in this country, and his contributions to Addison's disease. In tuberculosis he always took a very warm interest. For many years he was supposed to be a victim of pulmonary tuberculosis, and indeed the autopsy showed that he had a healed patch of the disease in one lung. In lectures and in numerous general articles he dwelt upon the great importance of the disease. One of his most interesting contributions was on the local treatment of cavities in the lungs. He also made an extensive investigation into the subject of pulmonary tuberculosis in the State of Pennsylvania. Diseases of the stomach and intestines were always favorite subjects of study. His papers on appendicitis were of special value, particularly those upon the relapsing form of the disease. His work on pulmonary tuberculosis early led him to make careful inquiries into the climate of different sections of the country, and few members of the profession had a more accurate knowledge of the subject. He was a strong believer in the value of the mineral springs of this country, and some years ago, with Dr. Daland, he collected an enormous amount of material which was the basis for his Report on the Mineral Springs of America. In 1893 he edited the American Text-Book of Medicine, which had a large sale, and served to keep his name prominently before the profession.

III.

As a man the late Provost formed a most interesting study, and as I had such a warm appreciation of his character, I may, in the privilege of friendship, say a few words of a more personal nature.

I remember as though it were yesterday the occasion of our first meeting in 1881. I had come to Philadelphia to look over the museums and hospitals. I was much impressed with his cordiality, the ease of his manner, the freshness and elasticity of his mind. He was just starting to his lecture, and I was delighted to accompany him. For years I had not listened to a clinic so well and so artistically planned, and conducted with such readiness. I did not see him again until I became his colleague. In five years of pleasant fellowship in the Faculty of the University of Pennsylvania I remember to have been seriously vexed with him but once, and that was on account of my present confrère, Howard Kelly. A number of us had backed that Kensington colt—as we called him in those days—I forget for what appointment. I only remember that I was very keen about it at the time. At the last moment Pepper entered a dark horse, who won easily to our great chagrin. To my warm expostulations he listened with great patience, but after about five minutes of that delightful persuasiveness which was so freely at his command, I left him, not only with all bitterness assuaged, but almost sorry that I had not supported his candidate. In Athens he would have been called a sophist, and I do not deny that he could, when the occasion demanded, play old Belial, and make the worse appear the better cause, to perplex and darken maturest counsel—but how artistically he could do it!

His faults? I am not here either to portray or to defend them.

“They say, best men are moulded out of faults;
And, for the most, become much and more the better
For being a little bad.”

He was human, and to those of a man he added the failings of a college president. To some sedate Philadelphians he seemed a modern Machiavelli, but a man engaged in vast schemes with many clashing interests is sure to be misunderstood, and to arouse sharp hostility in many quarters. The average citizen, if he does not understand, is very apt to dread or to dislike a new Ulysses.

In many ways the American is the modern Greek, particularly in that power of thinking and acting, which was the strongest Hellenic characteristic. Born and bred in one of

the most conservative of cities, surrounded by men who loved the old order, and who hated change, or even the suggestion of it, Pepper displayed from the outset an adaptability and flexibility truly Grecian. He was preeminently a man of felicities and facilities, to use a somewhat flash but most suitable phrase. Matthew Arnold's comment upon the happy and gracious flexibility which was so incarnate in Pericles has often occurred to me in thinking of the character of the late Provost: "Lucidity of thought, clearness and propriety of language, freedom from prejudice, freedom from stiffness, openness of mind, and amiability of manner." There was another Grecian feature which must not be lost sight of. You remember in the *Timæus* how the Egyptian Priest said to Solon: "You Hellenes are never anything but children; there is not an old man among you in mind you are all young." To the very last there was a youthful hopefulness and buoyancy of spirits about Pepper that supported him in many trials and troubles. I never knew him despondent or despairing. If things looked dark, if plans and projects on which his heart were set had miscarried, he met the disappointment with a smile, which robbed it of half its power. The persistency of this buoyant hopefulness often wore out the most obstinate opposition; in fact, it was irresistible. Nor was it the hopefulness which we condemn as visionary, but a resourceful hopefulness, based on confidence in himself, and, most valuable quality of all, capable of inspiring confidence in others.

Nor must I neglect to bear testimony to his inherent kindness of heart. Busy and prosperous, and so much absorbed in large projects and with the care of lives very important in a community, a great physician is apt to slight the calls of the poor and needy, whose lives are of importance only to themselves. Necessarily his contact with such is in the hospital wards. The family physician has not a monopoly of the charity work. The consultant has often to take a share, and with his large and varied associations, Pepper had an unusual number of calls upon his time and sympathy, as well as upon his purse, and to all he responded with a gracious liberality. Only a year or two ago an instance came to my notice which illustrated his kindness. From one of the lower counties of Maryland one of those sad

wrecks which "the little red school-house" is apt to make of women, had been under Pepper's care at the University Hospital. She had improved very much, had been able to return to work, but after a time had again broken down. She had written to him for advice. In reply he urged her to put herself under my care at the Johns Hopkins Hospital, which was much more accessible, and he offered to give her a note of introduction to me. I was much impressed by the kindly tone of the letter, which was written with his own hand (an unusual event of late years with him), and full of consideration and sympathy.

Not endowed, it was supposed, with a very strong constitution, the wonder is that he should have been able to do so much and to live so long. The 'bridle of Theages,' an inherited or acquired delicateness which has often proved in its possessor a blessing to the race, was no checkrein to him; and I have heard him say that he preferred the life of a salmon to that of the turtle. Though premature in one sense, his death came after he had seen fulfilled the desire of his eyes, and to the rich life which he had lived the future could have added but little, though doubtless his restless spirit would have driven him into fresh fields. The reformation of medical education, the reorganization of the University of Pennsylvania, the establishment of a great Commercial Museum and a Free Library—these and a score of minor plans he had either seen completed or well under way. Surely if ever a man could sing a *Nunc Dimittis* it was William Pepper! But as no man liveth, so no man dieth to himself, and we may mourn with those who shared his inner life, and who so generously gave so much of it to us of the profession and to the public. For them we feel his loss to be irreparable, his death to be premature. For them we could have wished an extension of his time to the Psalmist's limit.

I have no desire to criticise the method of his life. Exceptional men cannot be judged by ordinary standards. The stress and strain of thirty years told severely on his arteries, and for two or three years there had been unmistakable warnings in attacks of angina pectoris. He kept at work with vigor unabated until last spring, when he had signs of dilatation of the heart, with bronchitis and dyspnoea. The last time I saw him, in May, I think, he was in bed, improving

rapidly, he said, and very cheerful, talking much of his plans, particularly of the Commercial Museum and of the Library. He spoke of a proposed visit to the Pacific Coast, and of the good it was sure to do him. Then came the sad announcement of his death in California—a shock to all his friends, since, with the discretion which we doctors often exercise, the secret of his serious attacks had been well kept. I may be permitted to quote one or two extracts from a letter from his physician, who was with him at the time: “He died at eight in the evening with a copy of *Treasure Island* in his hands. At seven I had left him gazing upon Mount Diabolo, shadowed in the gathering darkness. I was called at eight and found him in the attitude and with the expression of *angor animi*, from which he never roused. He had suffered a few months before with cardiac dilatation; at the time of his death he was recovering the lost compensation, and appeared on the clear road to recovery. He had said a few days before ‘the battle has been won.’ Throughout his illness he exhibited the most perfect disposition and the greatest patience and forbearance. . . . The fatal attack was, I think, about the seventh, extending over a period of three years; the last previous attack was in April, at the time he was lecturing upon angina pectoris. He knew that the end must come some day, but he did not expect it so soon. I have never seen so beautiful a nature in sickness; his conduct and disposition were worthy of Marcus Aurelius.”

With such a book as *Treasure Island* in his hand, we can imagine that the great Enchanter of the Pacific had filled his mind with the possibilities of peace and quiet (so long denied him)—possibilities turned instantly to realities with the summons to the peace and quiet of an eternal rest. Some lines of the same writer express both the spirit in which William Pepper utilized his time in the service of his fellow-men, and the chief lesson of his life to us who survive:—

“Contend, my soul, for moments and for hours;
Each is with service pregnant, each reclaimed
Is as a Kingdom conquered, where to reign.”

AFTER TWENTY-FIVE YEARS.

AN ADDRESS

AT THE OPENING OF THE SESSION OF
THE MEDICAL FACULTY, MCGILL
UNIVERSITY, SEPT. 21st, 1899.

BY

WILLIAM OSLER. M.D., F.R.S.,

Professor of Medicine, Johns Hopkins University,
Baltimore, Md.

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I.

From two points of view alone have we a wide and satisfactory view of life—one, ere the dew of youth has been brushed off, as we stand at the foot of the hill, eager for the journey, amid the glorious tints of the early morn ; the other, wider, perhaps less satisfactory, as we gaze from the summit, at the lengthening shadows cast by the setting sun. From no points in the ascent have we the same broad outlook, as the steep and broken pathway affords few halting places with an unobscured view. You remember in the ascent of the Mountain of Purgatory, Dante, after a stiff climb, reached a high terrace encircling the hill, and sitting down turned to the East, remarking to his good leader—"all men are delighted to look back." So on this occasion, from the terrace of a quarter of a century, I am delighted to look back, and to be able to tell you of the prospect.

Twenty-five years ago this Faculty, with some hardihood, selected a young and untried man to deliver the lectures on the Institutes of Medicine. With characteristic generosity the men who had claims on the position in virtue of service in the school, recognizing that the times were changing, stepped aside in favor of one who had had the advantage of post-graduate training in the subjects to be taught. An experiment on the part of the Faculty, enthusiasm, constitutional energy, and a fondness for the day's work on my part led to a certain measure of success. I have tried to live over again in memory those happy early

days, but by no possible effort can I recall much that I would fain remember. The dust of passing years has blurred the details, even in part the general outlines of the picture. The blessed faculty of forgetting is variously displayed in us. In some, as in our distinguished countryman, John Beattie Crozier, it is absent altogether, and he fills chapter after chapter with delightful reminiscences and descriptions of his experiences and mental states.* At corresponding periods—we are about the same age—my memory hovers like a shade about the magic circle which Ulysses drew in Hades, but finds no Tiresias to lift the veil with which oblivion has covered the past. Shadowy as are these recollections, which,

“be they what they may
Are yet the fountain light of all our day,
Are yet a master light of all our seeing,”

they are doubly precious from their association with men who welcomed me into the Faculty, now, alas ! a sadly reduced remnant. To them—to their influence, to their example, to the kindly encouragement I received at their hands—I can never be sufficiently grateful. Faithfulness in the day of small things may be said to have been the distinguishing feature of the work of the Faculty in those days. The lives of the senior members taught us youngsters the lesson of professional responsibility, and the whole tone of the place was stimulating and refreshing. It was an education in itself, particularly in the amenities of faculty and professional life, to come under the supervision of two such Deans as Dr. George Campbell and Dr. Palmer Howard. How delightful it would be to see the chairs which they adorned in the school endowed in their memories and called by their names !

One recollection is not at all shadowy—the contrast in my feelings to-day only serves to sharpen the outlines. My first appearance before the class filled me with a tremulous uneasiness and an overwhelming sense of embarrassment. I had never lectured, and the only paper I had read before a society was with all the possible vaso-motor accompaniment. With a nice consideration my colleagues did not add to my distress by their presence, and once inside the lecture room the friendly greeting of the boys calmed my fluttering heart, and, as so often happens, the ordeal was most severe in anticipation. One permanent impression of the session abides—the awful task of the preparation of about one hundred lectures. After the ten or twelve with which I started were exhausted I was on the treadmill for the remainder of the session. False pride forbade the reading of the excellent lectures of my predecessor, Dr. Drake, which, with his wonted goodness of heart, he had offered.

* *My Inner Life*, Longmans, 1898.

I reached January in an exhausted condition, but relief was at hand. One day the post brought a brand-new work on physiology by a well-known German professor, and it was remarkable with what rapidity my labors of the last half of the session were lightened. An extraordinary improvement in the lectures was noticed; the students benefitted, and I gained rapidly in the facility with which I could translate the German.

Long before the session was over I had learned to appreciate the value of the position entrusted to me, and sought the means to improve the methods of teaching. I had had the advantage of one of the first systematic courses on practical physiology given at University College, London, a good part of which consisted of lessons and demonstrations in histology. In the first session, with but a single microscope, I was only able to give the stock display of the circulation of the blood, ciliary action, etc., but a fortunate appointment as physician to the smallpox department of the General Hospital carried with it a salary which enabled me to order a dozen Hartnack microscopes and a few bits of simple apparatus. This is not the only benefit I received from the old smallpox wards, which I remember with gratitude, as from them I wrote my first clinical papers. During the next session I had a series of Saturday demonstrations, and gave a private course in practical histology. One grateful impression remains—the appreciation by the students of these optional and extra hours. For several years I had to work with very scanty accommodation, trespassing in the chemical laboratory in winter, and in summer using the old cloak room downstairs for the histology. In 1880 I felt very proud when the faculty converted one of the lecture rooms into a physiological laboratory and raised a fund to furnish and equip it. Meanwhile I had found time to take my bearings. From the chair of the Institutes of Medicine both physiology and pathology were taught. It has been a time-honoured custom to devote twenty lectures of the course to the latter, and as my colleagues at the Montreal General Hospital had placed the post-mortem room at my disposal I soon found that my chief interest was in the pathological part of the work. In truth, I lacked the proper technique for practical physiology. For me the apparatus never would go right, and I had not a *Diener* who could prepare even the simplest experiments. Alas! there was money expended (my own usually, I am happy to say, but sometimes my friends', as I was a shocking beggar!) in apparatus that I never could set up, but over which the freshmen firmly believed that I spent sleepless nights in elaborate researches. Still one could always get the blood to circulate, cilia to wave and the fibrin to digest. I do not think that any member of the ten successive classes to which I lectured understood the structure of a lymphatic gland, or of the spleen, or of the placental circulation. To those structures I have to-day

an ingrained hatred, and I am always delighted when a new article comes out to demonstrate the folly of all preceding views of their formation. Upon no subjects had I harder work to conceal my ignorance. I have learned since to be a better student, and to be ready to say to my fellow students "I do not know." Four years after my college appointment the Governors of the Montreal General Hospital elected me on the visiting staff. What better fortune could a young man desire! I left the same day for London with my dear friend, George Ross, and the happy days we had together working at clinical medicine did much to wean me from my first love. From that date I paid more and more attention to pathology and practical medicine, and added to my courses one in morbid anatomy, another in pathological histology, and a summer class in clinical medicine. I had become a pluralist of the most abandoned sort, and by the end of ten years it was difficult to say what I did profess, and I felt like the man to whom Plato, in *Alcibiades II.* applies the words of the poet:—

"Full many a thing he knew ;
But knew them all badly."

Weakened in this way, I could not resist when temptation came to pastures new in the fresh and narrower field of clinical medicine.

After ten years of hard work I left this city a rich man, not in this world's goods, for such I have the misfortune—or the good fortune—lightly to esteem, but rich in the goods which neither rust nor moth have been able to corrupt,—treasures of friendship and good fellowship, and those treasures of widened experience and a fuller knowledge of men and manners which contact with the bright minds in the profession necessarily entails. My heart, or a good bit of it at least, has stayed with these treasures. Many a day I have felt it turn towards this city to the dear friends I there left, my college companions, my teachers, my old chums, the men with whom I lived in closest intimacy, and in parting from whom I felt the *chordæ tendineæ* grow tense.

II.

Twenty-five years ago the staff of this school consisted of the historic septenary, with one demonstrator. To-day I find on the roll of the Faculty 52 teachers. Nothing emphasizes so sharply the character of the revolution which has gradually and silently replaced in great part for the theoretical, practical teaching, for the distant, cold lecture of the amphitheatre the elbow to elbow personal contact of the laboratory. The school, as an organization, the teacher and the student have been profoundly influenced by this change.

When I joined the faculty its finances were in a condition of delight-

ful simplicity, so simple indeed that a few years later they were intrusted to my care. The current expenses were met by the matriculation and graduation fees and the government grant, and each professor collected the fees and paid the expenses in his department. To-day the support of the laboratories absorbs a much larger sum than the entire income of the school in 1874. The greatly increased accommodation required for the practical teaching has made endowment a vital necessity. How nobly, by spontaneous gifts and in generous response to appeals, the citizens have aided the efforts of this faculty I need not remind you. Without it McGill could not have kept pace with the growing demands of modern methods. Upon one feature in the organization of a first-class school permit me to dwell for a moment or two. The specialization of to-day means a group of highly trained experts in the scientific branches, men whose entire energies are devoted to a single subject. To attain proficiency of this sort much time and money are required. More than this, these men are usually drawn from our very best students, with minds above the average. For a majority of them the life devoted to science is a sacrifice ; not, of course, that it is so felt by them, since the very essence of success demands that in their work should lie their happiness. I wish that the situation could be duly appreciated by the profession at large, and by the trustees, governors and the members of the faculties throughout the country. Owing these men an enormous debt, since we reap where they have sown, and garner the fruits of their husbandry, what do we give them in return ? Too often beggarly salaries and an exacting routine of teaching which saps all initiative. Both in the United States and Canada the professoriate as a class, the men who live by college teaching, is wretchedly underpaid. Only a few of the medical schools have reached a financial position which has warranted the establishment of thoroughly equipped laboratories, and fewer still pay salaries in any way commensurate with the services rendered. I am fully aware that with cobwebs in the purse not what a faculty would desire has only too often to be done, but I have not referred to the matter without full knowledge, as there are schools with large incomes in which there has been of late a tendency to cut down salaries and to fill vacancies too much on Wall Street principles. From Harvard comes a most encouraging announcement. By the will of the late Dr. Calvin Ellis the Medical School receives nearly half a million dollars, the income from which is to be used in raising the salaries of the scientific chairs to \$5000 per annum. And not for relief of the pocket alone would I plead. The men in charge of our Canadian laboratories are overworked in teaching. A well organized staff of assistants is very difficult to get, and still more difficult to get paid. The salary of the professor should be in many cases that of the first assistant. When the entire energy of a laboratory

is expended on instruction, research, a function of equal importance, necessarily suffers. Special endowments are needed to meet the incessant and urgent calls of the scientific staff. It is gratifying to know that certain of the bequests to this school have of late been of this kind, but I can safely say that no department is as yet fully endowed. Owing to faulty conditions of preliminary education the medical school has to meet certain illegitimate expenses. No one should be permitted to register as a medical student who had not a good preliminary training in chemistry. It is an anomaly that our schools should continue to teach general chemistry, to the great detriment of the subject of medical chemistry, which alone belongs in the curriculum. Botany occupies a similar position.

But *the* laboratories of this medical school are not those directly under its management. McGill College turned out good doctors when it had no scientific laboratories, when the Montreal General Hospital and the University Maternity were its only practical departments. Ample clinical material and good methods of instruction gave the school its reputation more than fifty years ago. Great as has been the growth of the scientific half of the school, the all-important practical half has more than kept pace. The princely endowment of the Royal Victoria Hospital by our large-hearted Canadian Peers has doubled the clinical facilities of this school, and by the stimulus of a healthy rivalry has put the Montreal General Hospital into a condition of splendid efficiency. Among the many changes which have occurred within the past twenty-five years, I would place these first in order of importance, since they assure the continued success of McGill as a school of practical medicine.

Equally with the school as an organization, the teacher has felt deeply the changed conditions in medical education, and many of us are much embarrassed to know what and how to teach. In a period of transition it is not easy to get *orientiert*. In some subjects fortunately there is but the single difficulty—what to teach. The phenomenal strides in every branch of scientific medicine have tended to overload it with detail. To winnow the wheat from the chaff and to prepare it in an easily digested shape for the tender stomachs of first and second year students taxes the resources of the most capable teacher. The devotion to a subject, and the enthusiasm and energy which enable a man to keep abreast with its progress, are the very qualities which often lead him into pedagogic excesses. To reach a right judgment in these matters is not easy, and after all it is in teaching as Izaak Walton says of angling, "Men are to be born so, I mean with inclinations to it." For many it is very hard to teach down to the level of beginners. I was told a good story illustrating this a few weeks ago. One of the most distinguished—no, the most distinguished of Scotch professors had gone off for a few weeks

during the term, leaving his first assistant, named Day, in charge of his work. As is not infrequently the case, the junior caught the ear of the class better than the master. On the blackboard just before the Professor returned one of the students wrote, "Work while it is Day, for the (k)night cometh when no man can work." The old time lecture room teacher is rapidly giving place to the demonstrator and the class instructor. Professors, like doctors, may be divided into four classes. It was a parson (Mr. Ward, Rector of Stratford-on-Avon shortly after Shakespeare's day) who gave the well-known libellous division of doctors :—"first, those that can talk but doe nothing ; secondly, some that can doe but not talk ; third, some that can both doe and talk ; fourthly, some that can neither doe nor talk—and these get most monie." Of professors the first is the man who can think but who has neither tongue nor technique. Useless for the ordinary student, he may be however the leaven of a faculty and the chief glory of his university. A second variety is the phonographic professor, who can talk but who can neither think nor work. In the old régime he repeated year by year the same lecture. A third is the man who has technique but who can neither talk nor think ; and a fourth is the rare professor who can do all three—think, talk and work. With these types fairly represented in a faculty, the diversities of gifts only serving to illustrate the wide spirit of the teacher, the Dean at least should feel happy.

But the problem of all others which is perplexing the teacher to-day is not so much what to teach, but how to teach it, more especially how far and in what subjects the practical shall take the place of didactic teaching. All will agree that a large proportion of the work of a medical student should be in the laboratory and in the hospital. The dispute is over the old-fashioned lecture, which has been railed against in good set terms, and which many would like to see abolished altogether. It is impossible, I think, to make a fixed rule, and teachers should be allowed a wide discretion. With the large classes of many schools the abolition of the didactic lecture would require a total reconstruction of the curriculum and indeed of the faculty. Slowly but surely practical methods are everywhere taking the place of theoretical teaching, but there will, I think, always be room in a school for the didactic lecture. It is destined within the next ten years to be much curtailed, and we shall probably, as is usual, go to extremes, but there will always be men who can present a subject in a more lucid and attractive manner than it can be given in a book. Sir William Gairdner once remarked that the reason why the face and voice of the teacher had so much more power than a book is that one has a more living faith in him. Years ago Murchison (than whom Great Britain certainly never had a more successful teacher of medicine) limited the lecture in medicine to the consideration of rare

cases, and the prominent features of a group of cases, and to questions of prognosis which cannot be discussed at the bedside. For the past four years in the subject of medicine I have been making an experiment in teaching only by a weekly examination on a set topic, by practical work in the wards, in the out-patient room and the clinical laboratory, and by a weekly consideration in the amphitheatre of the acute diseases of the season. With a small class I have been satisfied with the results, but the plan would be difficult to carry out with a large body of students.

The student lives a happy life in comparison with that which fell to our lot thirty years ago. Envy, not sympathy, is my feeling towards him. Not only is the *ménue* more attractive, but it is more diversified and the viands are better prepared and presented. The present tendency to stuffing and cramming will be checked in part when you cease to mix the milk of general chemistry and botany with the proper dietary of the medical school. Undoubtedly the student tries to learn too much, and we teachers try to teach him too much—neither, perhaps, with great success. The existing evils result from neglect on the part of the teacher, student and examiner of the great fundamental principle laid down by Plato—that education is a life-long process, in which the student can only make a beginning during his college course. The system under which we work asks too much of the student in a limited time. To cover the vast field of medicine in four years is an impossible task. We can only instil principles, put the student in the right path, give him methods, teach him how to study, and early to discern between essentials and non-essentials. Perfect happiness for student and teacher will come with the abolition of examinations, which are stumbling blocks and rocks of offence in the pathway of the true student. And it is not so Utopian as may appear at first blush. Ask any demonstrator of anatomy ten days before the examinations, and he should be able to give you a list of the men fit to pass. Extend the personal intimate knowledge such as is possessed by a competent demonstrator of anatomy into all the other departments, and the degree could be safely conferred upon certificates of competency, which would really mean a more thorough knowledge of a man's fitness than can possibly be got by our present system of examination. I see no way of avoiding the necessary tests for the license to practice before the provincial or state boards, but these should be of practical fitness only, and not, as is now so often the case, of a man's knowledge of the entire circle of the medical sciences. It is satisfactory to know that close attention is being paid to the problem how to relieve the present congested state of the medical curriculum, and a number of interesting experiments are in operation. Of the special measures of relief which have been proposed the concentration of courses and a wide system of electives in the special branches are the most impor-

tant. A strong feeling prevails that we tie up the student too tightly in leading strings, and do not allow, particularly to good men, sufficient liberty. In our present system we make no distinction whatever between the poor, the mediocre and the good student. It is interesting to note that the question has been dealt with most fully and most warmly in the interests of the practical student by two of the leading scientific teachers in the United States, Dr. Henry P. Bowditch, of Harvard (Boston Medical and Surgical Journal, Dec. 29th, 1898), and my colleague at the Johns Hopkins, Dr. Mall (Philadelphia Medical Journal, April 1st, 1899). Their papers are to be carefully pondered by all teachers who feel that reform is necessary. I would commend them particularly to the younger men, in whose hands alone such radical changes can be carried out. A man who has been teaching for twenty-five years is rarely in a position to appreciate the necessity of a change, particularly if it touches his own special branch.

(Dr. Osler then referred briefly to the subject of Dominion Registration, and expressed the hope that the necessary legislation would be carried through at an early date. He hoped that it might prove a prelude to a more extensive measure of Imperial Registration which would enable registered graduates of Canadian universities to practice in any part of Her Majesty's possessions.)

III.

But what is most important in an introductory lecture remains to be spoken, for dead indeed would I be to the true spirit of this day, were I to deal only with the questions of the curriculum and say nothing to the young men who now begin the serious work of life. Personally, I have never had any sympathy with the oft repeated sentiment expressed originally by Abernethy, I believe, who, seeing a large class of medical students, exclaimed, "Good God, gentlemen! whatever will become of you?" The profession into which you enter to-day guarantees to each and every one of you a happy, contented, and useful life. I do not know of any other of which this can be said with greater assurance. Many of you have been influenced in your choice by the example and friendship of the doctor in your family, or of some country practitioner in whom you have recognized the highest type of manhood and whose unique position in the community has filled you with a laudable ambition. You will do well to make such an one your exemplar, and I would urge you to start with no higher ambition than to join the noble band of general practitioners. They form the very sinews of the profession—generous-hearted men, with well-balanced, cool heads, not scientific always, but learned in the wisdom not of the laboratories but of the sick room. This school can take a greater pride in her graduates scattered throughout

the length and breadth of the continent than in her present splendid equipment ; they explain in great part the secret of her strength.

I was much interested the other day in reading a letter of John Locke's to the Earl of Peterborough who had consulted him about the education of his son. Locke insisted that the main point in education is to get "a relish of knowledge." "This is putting life into a pupil." Get early this relish, this clear, keen joyance in work, with which languor disappears and all shadows of annoyance flee away. But do not get too deeply absorbed to the exclusion of all outside interests. Success in life depends as much upon the man as on the physician. Mix with your fellow students, mingle with their sports and their pleasures. You may think the latter rash advice, but now-a-days even the pleasures of a medical student have become respectable, and I have no doubt that the "footing supper," which in old Coté street days was a Bacchanalian orgie, has become a love feast in which the Principal and even the Dean might participate. You are to be members of a polite as well as of a liberal profession and the more you see of life outside the narrow circle of your work the better equipped will you be for the struggle. I often wish that the citizens in our large educational centres would take a little more interest in the social life of the students, many of whom catch but few glimpses of home life during their course.

As to your method of work, I have a single bit of advice, which I give with the earnest conviction of its paramount influence in any success which may have attended my efforts in life—*Take no thought for the morrow.* Live neither in the past nor in the future, but let each day's work absorb your entire energies, and satisfy your widest ambition. That was a singular but very wise answer which Cromwell gave to Bellevire—"No one rises so high as he who knows not whither he is going," and there is much truth in it. The student who is worrying about his future, anxious over the examinations, doubting his fitness for the profession, is certain not to do so well as the man who cares for nothing but the matter in hand, and who knows not whither he is going !

While medicine is to be your vocation, or calling, see to it that you have also an avocation—some intellectual pastime which may serve to keep you in touch with the world of art, of science, or of letters. Begin at once the cultivation of some interest other than the purely professional. The difficulty is in a selection and the choice will be different according to your tastes and training. No matter what it is—but have an outside hobby. For the hard working medical student it is perhaps easiest to keep up an interest in literature. Let each subject in your year's work have a corresponding outside author. When tired of anatomy refresh your mind with Oliver Wendell Holmes ; after a worrying subject in physiology, turn to the great idealists, to Shelley or Keats for

consolation; when chemistry distresses your soul, seek peace in the great pacifier, Shakespeare ; and when the complications of pharmacology are unbearable, ten minutes with Montaigne will lighten the burden. To the writings of one old physician I can urge your closest attention. There have been, and, happily, there are still in our ranks notable illustrations of the intimate relations between medicine and literature, but in the group of literary physicians Sir Thomas Browne stands preëminent. The *Religio Medici*, one of the great English classics, should be in the hands—in the hearts too—of every medical student. As I am on the confessional to-day, I may tell you that no book has had so enduring an influence on my life. I was introduced to it by my first teacher, the Rev. W. A. Johnson, Warden and Founder of the Trinity College School, and I can recall the delight with which I first read its quaint and charming pages. It was one of the strong influences which turned my thoughts towards medicine as a profession, and my most treasured copy—the second book I ever bought—has been a constant companion for thirty-one years,—comes *viæ vitæque*.* Trite but true, is the comment of Seneca—"If you are fond of books you will escape the ennui of life, you will neither sigh for evening disgusted with the occupations of the day—nor will you live dissatisfied with yourself or unprofitable to others."

And, finally, gentlemen, remember that you are here not to be made chemists or physiologists or anatomists but to learn how to recognize and treat disease, how to become practical physicians. Twenty years ago, during the summer session, I held my first class in clinical medicine at the Montreal General Hospital, and on the title page of a note book I had printed for the students I placed the following sentence, which you will find the alpha and omega of education in practical medicine.

"The knowledge which a man can use is the only real knowledge, the only knowledge which has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain or dries like rain drops off the stones."

* There are two excellent editions of the *Religio Medici* available, the one in the Golden Treasury Series, MacMillan & Co., edited by the late Dr. W. A. Greenhill, the other edited by Dr. D. Lloyd Roberts, of Manchester, Smith, Elder & Co., London.

A movement is on foot to erect a memorial to Sir Thomas Browne in his native city, Norwich, subscriptions towards which will be received by Sir Peter Eade, Norwich.

THE DIAGNOSIS OF
TYPHOID FEVER.

*A Discussion at the New York
State Medical Association,
October 25, 1899.*

BY

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Professor of Medicine, Johns Hopkins University, Baltimore.

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PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY, BALTIMORE.

“THERE is no one symptom, there are no two or three symptoms, which, in themselves, are characteristic of the disease. There is no one symptom, there are no two or three symptoms, usually occurring in the disease, which may not be absent during its entire progress. Our diagnosis can never be founded here, as it is in many other instances, on a few positive, physical signs. It must always be rational, not absolute. The evidence, upon which our verdict is to be rendered, is wholly circumstantial. Notwithstanding all this, and although cases sometimes occur so enveloped in obscurity as to baffle the skill of the most careful and experienced observers, it is still true that there are few general diseases the diagnosis of which is so well established, and so certain, as that of typhoid fever.”

These statements, taken from the remarkable work of Elisha Bartlett, *On Typhoid and Typhus Fevers*, 1842, express, with slight modifications, the position

of the profession to-day on this all-important problem. I quote it designedly to emphasize at the outset the uncertainty which still besets us in dealing with some cases of this protean disease, notwithstanding the extraordinary advances in our clinical and bacteriological knowledge. In the time at my disposal it will be best to summarize the questions briefly in four divisions, which illustrate the conditions under which difficulty in diagnosis is experienced: First, variations in the intensity of the infection; second, the early and pronounced localization of the infection; third, peculiarities in the symptoms; and fourth, certain diseases which simulate typhoid.

I. VARIATIONS IN THE INTENSITY OF THE INFECTION. (a) *The Mild Cases*.—Every autumn we meet with cases of illness, from five to eight or ten days' duration, sometimes longer, in which, with gastro-intestinal disturbance, indicated by a furred tongue and diarrhœa, or quite as frequently constipation, there is a fever of slight grade. Perhaps on deep palpation the edge of the spleen may be felt. In such a case the appearance of a few rose spots may clear up the diagnosis, but in other instances the practitioner remains in doubt whether the condition is a simple continued fever or a mild typhoid infection. A relapse, with characteristic symptoms, or a well-defined post-typhoid lesion, may give the diagnosis; but most important of all is the presence or absence of the Widal reaction, which is nowhere of greater help than in this group. While it may not be present at first, even not until the fever has disappeared, it has been of very great service, and will be, I am sure, when more widely used, a special boon in these cases. The method should be employed in widespread epi-

demics to help in the diagnosis of the milder forms. I may remind you of the exceedingly interesting account from Professor Sahli's clinic, at Bern, of the outbreak of typhoid fever in an asylum of the canton. In addition to thirty patients who had attacks severe enough to demand hospital treatment, there were twelve who had such slight symptoms as headache, fever, and diarrhœa, lasting only for a few days, and not severe enough to confine them to bed, yet the Widal reaction was characteristic. I am sure that a widespread application of the test will restrict within very narrow limits the cases of so-called simple continued fever.

(b) *Acute Typhoid Septicæmia*.—At the other extreme is the remarkable group in which the patients present the evidence of an acute infection of great severity without any localizing symptoms. For a week or ten days the picture is that of a profound toxæmia, with high fever and early delirium. Death may occur before it is possible to reach a diagnosis; even the Widal reaction may not be present. A post-mortem may show the characteristic enteric lesions, but not always, and the reports of Chiari, Flexner, Hodenpyl, and others have taught us to recognize typhoid fever without intestinal localization. There are cases in which a post-mortem diagnosis is negative, and only a bacteriological study may reveal the true nature of the disease.

II. EARLY AND PRONOUNCED LOCALIZATION OF THE INFECTION.—A majority of the cases of typhoid fever present no symptoms indicative of the special involvement of any organ or group of organs. A large proportion have no intestinal symptoms. Of thirty-five cases which have been under my care during the present month only four have had severe abdominal symptoms. The

profession has had its attention too strongly directed to the enteric character of the disease; hence it not infrequently happens that we are completely taken off our guard when the brunt of a very acute infection falls upon some other system. Of these, the cerebro-spinal, the pulmonary, and the renal localizations are the most deceptive. Agonizing headache, severe neuralgia, delirium, or even furious mania may be the first symptoms of the disease. The so-called brain fever, the acute febrile mania, and cases with symptoms of cerebro-spinal meningitis are not infrequently typhoid fever, and it is important to remember that under the most favorable circumstances death may occur before a positive diagnosis is reached. A post-mortem may alone clear the obscurity, and in its absence the physician can scarcely be blamed when he returns the case to the health board under one of the above designations. Widespread bronchitis, acute pleurisy, with friction and subsequent effusion, early consolidation of a lobe of one lung may mask the true nature of the disease. The early renal localization is almost certainly called (as it is, of course) acute nephritis, of which there may be no single feature lacking, and the suggestion of typhoid fever may be delayed for ten days or more, when enteric symptoms appear, or the fever becomes more intense, or rose spots appear.

These clinical mistakes cause no little mortification to the young practitioner, who has not yet learned to dissociate his *amour propre* and infallibility in diagnosis. Even when hardened—humbled, I should say—by repeated exposure, it is not pleasant to be deceived, and a good rule is: When in doubt, keep your mouth shut. Unless one has a Cassioli-like volubility, in the flow of

which the friends of the patient lose all idea of your true opinion, the gift of taciturnity should here be cultivated.

III. PECULIARITIES IN THE SYMPTOMS. — Elisha Bartlett's dictum, with which I began this paper, must ever be borne in mind. There may be no fever (though afebrile typhoid fever is very rare; I have never seen—to recognize—a case); the onset may be abrupt; there may be no rose spots, no intestinal symptoms; the diazo reaction may be absent; the Widal test may be negative at the height of the disease; there may be leucocytosis, and yet, as Bartlett says, "there are few general diseases the diagnosis of which is so well established and so certain." It is just in these negative cases, with fever alone, that the Widal reaction and the blood count may give us the only positive data, and the practical clinical value of the former, when carefully made, can not be overestimated, and it should be more widely used by practitioners. Wyatt Johnston's method (the dried blood drop) can be utilized, and there are now in almost every State laboratories in which the test can be made. Of positive symptoms which may lead to error I have time to mention only one—viz., chills. How often have I heard the protest, "But, doctor, the patient has had chills, repeated chills; surely he must have malaria"! At the onset of the disease, at the onset of a relapse, as a result of treatment with antipyrine and antefebrin, at the onset of complications, in the typhoid septicæmia, and in the secondary infections of protracted cases and during convalescence, chills frequently occur. Most exceptionally they are due to malaria, which in reality is the last thing to be thought of (except in cases from the tropics), and the nature of which in any given case can

be determined by the blood examination and by the therapeutic test.*

IV. TYPHOID FEVER AND MALARIA.—I come now, Mr. President, to the only part of the subject worth discussing at the present moment—namely, the diagnosis of typhoid fever from certain other diseases. To gain time I pass by acute tuberculosis, which trips us all at intervals (and I may say I am feeling sore from a fall over it not ten days ago), cerebro-spinal fever, meningitis, typhus, and the other acute infections, to take up the really serious question of the diagnosis of typhoid from the malarial fevers. During fifteen years' practice in the middle region of the Atlantic coast I have had only too forcibly impressed upon me the strange readiness with which physicians diagnosticate a continued fever as malaria. In this period I do not remember to have seen in consultation, in town or country, a single instance of continued fever, diagnosticated as malaria, which did not prove to be typhoid fever. I was fully aware, perhaps few men more so, of the widespread existence of the strong delusion on this subject in the minds of the profession, but neither I nor, I think, you who listen to me now were prepared for such a remarkable exhibition of its strength as that with which the late war presented us. The paper of Dr. Vaughan, based on material collected by the commission appointed by Surgeon-General Sternberg to study the causes and spread of typhoid fever among the troops in the camps of the United States, has been characterized as an indictment of the general efficiency of the men in charge of the camps. A demonstration on a

* Chills in Typhoid Fever; Studies on Typhoid Fever, ii. *Johns Hopkins Hospital Reports*, vol. v.

wholesale scale was given of the ignorance in a large number of the members of our profession of essential elementary facts concerning these two diseases. While subscribing to the indictment, I feel that the gravity of the charge is less against the physicians than against those of us who occupy teaching positions. Who are the men responsible for this widespread error? Professor Dock, of Ann Arbor, who was on duty at the camp at Chickamauga, tells us in a few words. He says: "It is not necessary for me to defend the army medical service, for what struck me at the camps was the evidence of lack of knowledge of typhoid and malarial fevers in the profession at large. I came into contact with probably from sixty to seventy-five young physicians of a very good class, such as we would take into our hospitals as internes. Most of them, however, had no hospital experience, and very few seemed to have had any clinical experience with typhoid." The fault lies in reality with the system of teaching which permitted these young men to go out into practice without a thorough knowledge of typhoid fever. Here is the kernel of the whole matter. Looseness of diagnosis is inevitable while we send out the members of our graduating classes unfamiliar, by daily routine work in the hospital wards, with the clinical features of typhoid fever. But this is not the occasion on which to dwell further upon this point, while I bring it up only to place the responsibility for an acknowledged widespread ignorance where it should rest.

I have on a recent occasion, Mr. President, paid a tribute to the notable contributions on typhoid fever which have been made by three generations of American physicians. I am sorry that I can not speak in the same

warm terms of the present generation in relation to the study of the modern problems of malarial fever. Fifteen years have passed since Dr. Sternberg's paper introduced to us in this country the brilliant work of Laveran, and in spite of the numerous confirmatory researches which have been made in Philadelphia, Baltimore, New York, and elsewhere, the enormous practical gain—namely, that we are everywhere able under all circumstances to determine the presence or absence of a malarial infection, has not been appreciated fully by the practitioner at large. One has to sympathize a bit with him—clinical fetiches are given up with difficulty and regret! To many good, easy men it came as a shock, to find that malaria was really a well-defined, easily recognizable disease. Naturally, it was hard to abandon a word like *malaria*, which carried with it as much clinical comfort as did that blessed word *Mesopotamia* spiritual unction to the old lady. My sympathies have been deeply aroused by the distress which has been felt in many quarters of this city where you have been, until recently, with some notable exceptions, heretics of the worst kind. Nowhere, perhaps, has malaria ever covered such a multitude of diverse maladies. I came in contact with it first when in Montreal, a city in which malaria is unknown, so that when our patients returned from the hands of Gotham consultants with the diagnosis of malarial neurasthenia, or of latent malarial abscess of the liver, or of malarial headache of obscure origin, we learned to appreciate the mysteries of paludic infection as existing in the imagination of Manhattan practitioners. I have myself been scolded as too shockingly dogmatic on the subject, as some of you may remember, in a paper read a year or so ago by my friend,

Dr. Beverley Robinson; but I protest that dogmatic as I have been, I have not been dogmatic enough. Had we teachers throughout the country been more persistently dogmatic, the profession might have been spared the mortifying exhibition of last year. But as for so many of us, so for Dr. Robinson, there is no possible salvation in this respect until born again of the microscope and a prolonged course of study of the genuine disease.

Two clinical rules should guide practitioners above Mason and Dixon's line:

1. *An intermittent fever which resists quinine is not of malarial origin.* Infection with the tertian organism, producing quotidian or tertian paroxysms, is the only variety of malarial fever prevalent in the Northern and Middle States. This form of the parasite is peculiarly susceptible to the action of quinine, and even a grain or two daily may suffice to clear the blood within forty-eight hours. The constancy, the infallibility of the action of this drug is one of the most remarkable phenomena in medicine. Our clinical charts of simple intermittents, now numbering many hundreds, may be searched through and through without finding an instance in which the paroxysms were not checked by the use of quinine, and usually within thirty-six or forty-eight hours.

2. *In these localities a continued fever is not due to malarial infection.* I am speaking now, remember, of the regions named, in which the æstivo-autumnal organism and the graver forms of the disease caused by it are very rare. For remarkable complexity in the clinical manifestations, for variability in mode of onset, in the course, and in the symptoms, the æstivo-autumnal infection takes precedence even of typhoid fever. With

a vigilance quickened by repeated surprises, we are yearly made to feel the subtleness of this protozoan Proteus, which rivals "the old sea-tell-truth" of Homer's tale in clinical wiles and sleights.

So exceptional are cases of a continuous fever with tertian infection that they need not be considered, but the *æstivo-autumnal* fever may simulate typhoid very closely. I shall not detain you with any detailed account of the differentia, which are fully described in recent works, but I may dwell on one or two points. The fever in malaria from the outset is marked by remissions—hence the term remittent fever—of a grade rarely seen in typhoid until the late stages. Once the fastigium is reached, the fever in the latter presents a remarkable steadiness; the two-hour record may show for several days a variation of not more than a degree. The chart has a "Pennsylvania-Railway-like" directness, in marked distinction to the zig-zag "Baltimore-and-Ohio-Railway" chart of *æstivo-autumnal* fever. The early anæmia, with sallow complexion, often suggests the diagnosis, even when other symptoms are like those of typhoid fever.

It is in these cases that we find the enormous diagnostic value of Laveran's discovery. Unfortunately, the parasite of the *æstivo-autumnal* fevers is less easily recognized in the acute stages than the larger tertian form, and, moreover, it may be very scanty in the circulating blood. To become an expert in the examination of the malarial parasites requires a long and tedious apprenticeship, and there have been illustrated papers published in this country which make one wonder not less at the brazen audacity of the authors than at the gross ignorance of the editors of the journals. I would urge

most strongly, particularly upon the young house physician beginning the study, in all doubtful cases to keep well-made cover-slip preparations, which can be identified later by proper methods of staining. The recognition of an æstivo-autumnal infection of a week or ten days' duration is an easy matter from the presence of ovoids and crescents. Unlike the simple intermittents, the malarial continued fever is more resistant to quinine, and three or four days may elapse before the temperature falls, and the organisms do not disappear from the blood so promptly; indeed, the crescents and ovoids are remarkably resistant in comparison with the tertian form.

Combined infection with the typhoid and malarial germs is excessively rare; so rare, indeed, that only a single instance has been met with in the Johns Hopkins Hospital in ten years among nearly one thousand cases of typhoid fever. When it does occur, quinine readily settles the malarial side of the infection, while the typhoid fever pursues its usual course. It is to be hoped that the pernicious term typho-malarial fever has been forever banished from our nomenclature. Sheltered under it, a fancied sense of security has too often ended in a sad calamity, either to the patient or, in the absence of proper sanitary precautions, to the community.

But after all in any discussion on typhoid fever the appeal must be made to the hard-worked practitioners of the smaller towns and country districts (in which the disease is now most prevalent), who find it very hard, in the conditions of their lives, to take advantage of modern scientific methods of diagnosis. They must rely in great measure on experience and common sense, and to them I would say in conclusion—*learn to suspect*

typhoid fever, and not malaria, in every case of fever of six or seven days' duration, particularly if it resists the action of quinine. For too long you have employed the Anglo-Saxon method of procedure, and in a given case have assumed innocence of anything so serious as typhoid until in the onset of some serious symptom the guilt was only too evident! It is high time now, that you adopt the Gallic usage, and regard every case of continued fever as guilty, that is as a typhoid, until the contrary be clearly demonstrated.

Two recent works should be on the library table of every physician at this season of the year — Keen's *Surgical Complications* and Hare's *Medical Complications of Typhoid Fever*. They will stimulate that personal progressive education which all of us should seek — an education which carries with it, year by year, as experience widens, not alone a better knowledge of the clinical intricacies, but an ever-ripening wisdom which enables us to be more and more helpful to the pitiable victims of this disgraceful disease.

THE PRINCIPLES AND PRACTICE OF MEDICINE.

BY WILLIAM OSLER, M. D.,

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INTERSTITIAL PROCESSES IN THE CENTRAL
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By arrangement with the Referee I have agreed to confine my remarks to a presentation of certain points for discussion in connection with interstitial processes in the central nervous system. The subject is beset with difficulties. If we cannot hope in the present state of our knowledge to dispell the darkness which surrounds it, we may at least get an inkling of the direction in which to look for light ; if we cannot expect a solution of the problem which more than any other stretches to tension the pia mater of the neurologist, we can perhaps get a definite outline for our ignorance, which in any question is a great gain.

The connective tissue of the central nervous system is of two kinds, one special and peculiar, the neuroglia, derived from the ectoderm, with distinct morphological and chemical characters ; the other, derived from the mesoderm, is identical with the ordinary collagenous fibrous tissue of the body. Both play important parts in indurative processes in the brain and cord.

A convenient division of the sclerosis is into (1) the degenerative, (2), the inflammatory, and (3), the developmental.

The *degenerative* sclerosis comprise the largest and most important subdivision in which provisionally the following groups may be made :

(a) The common atrophic, secondary degeneration. Nerve fibres cut off from their idioplastic centres, i. e., their ganglia, die and their place is gradually occupied by neuroglia.

(b) Toxic forms, among which may be placed the sclerosis from lead and ergot and most important of all the posterior sclerosis due, in such a large proportion of cases, to the virus of syphilis. Other unknown toxic bodies, as in pernicious anæmia, may induce degeneration of the nerve fibres of certain tracts. The systemic paths differ in their susceptibility and the posterior columns appear most prone to undergo sclerosis.

(c) The sclerosis associated with changes in the smaller arteries and capillaries. As a senile process, a sclerotic atrophy of the convolutions

is one of the most common of cerebral lesions. Some of the forms of insular sclerosis are also found with marked arterial lesions. The relation of the induration to the vascular change is the question which, in the brain as in the other organs, has excited most controversy. Is the primary alteration a premature degeneration of the cells and fibres, to which the sclerosis is secondary, or is the essential factor an alteration in nutrition caused by a lesion of the capillaries and smaller arteries? This I would propose as the first question for discussion on this part of the subject.

The *inflammatory* scleroses embrace a less important and less extensive group which I would separate sharply from the degenerations, sometimes confounded with them. I would divide them into 1st, the secondary form which develops in consequence of reactive inflammation about tumors, hæmorrhages, foreign bodies, abscess and trauma. Histologically this is pure mesodermal sclerosis with a fibrous matrix similar to that which develops under like conditions in other parts of the body. 2d, the sclerosis which follows a primary encephalitis or meningo-encephalitis, or a myelitis. An acute process which may be termed inflammatory occurs in the central nervous system in consequence of the action of the poison of the specific fevers and possibly too of syphilis; also independently as poliomyelitis and as a polio-encephalitis. The terminal event is induration more or less extensive. How far that most interesting variety the sclerosis found in infantile hemiplegia is the outcome of an acute encephalitis is yet doubtful. The mode of onset in the child with fever, convulsions and marked constitutional disturbance speaks for an inflammatory process. The change is cortical, of variable extent, not following any vascular distribution, the meninges are adherent, and histologically the sclerosis is such as would follow an acute inflammation with destruction of tissue elements. This constitutes an extremely common variety of cerebral sclerosis and may involve a few convolutions or those of an entire lobe. The disease is not infrequent and is one of the most serious of all cerebral affections of children. Much discussion has taken place as to its true nature and with this I would link the second question for discussion now and for research hereafter,—the lobar scleroses of children, what is the nature of the primary lesion? inflammatory or vascular?

The *developmental* scleroses form a group to which of late special attention has been paid and an attempt has been made by French writers to place them in a position of importance which they have not heretofore occupied. The best known variety of this is the diffuse cortical sclerosis of children which is met with either as a congenital condition, when it may appear rather as an arrest of development, or

occurring later in life, gradually produces atrophy of one hemisphere. In such cases there may be no involvement of the meninges, no evidence of chronic inflammation and the process seems explicable only on the supposition of a developmental error, a vice of construction leading to progressive increase in the neuroglia.

A second form is the well known growth about the central canal which constitutes the anatomical basis in syringo-myelia, the essential factor in which is an enormous proliferation of the neuroglia of the central gray matter. The term *gliosis* has been applied to this variety which is now very generally regarded as a *lésion d'évolution*.

Thirdly, an interesting attempt has been made by Déjerine and Letulle to separate Friedrich's ataxia from the ordinary form and to place it among the developmental scleroses. This disease is distinguished from Romberg's tabes by its early onset, its occurrence in members of the same family, and according to the authors just named by definite histological peculiarities.

And lastly a most interesting study has been made by Chaslin on the brains of epileptics on which he claims to have found a sclerotic change of a distinctive kind quite apart from the ordinary form and suggestive of an association with a primitive fault of construction. The assertion is made that in these varieties the histological element is purely neuroglial, not admixed with ordinary connective tissue as in the other forms. It is in fact an *ectodermic* not a *mesodermic* sclerosis.

These statements have not passed without sharp criticism, particularly by Weigert, who denies the special characters of the anatomical changes in these affections. The subject is still an open one, fresh, and of peculiar interest, and I would propose as the third question for discussion now—and to some forethought and work hereafter: How far can we recognize in the scleroses of the brain and cord a separation into an ectodermic, purely neuroglial form, a mesodermic (connective tissue) form, and mixed varieties?*

* Illustrations were shown of the various forms of cerebral sclerosis.

THE HOME TREATMENT OF CONSUMPTION.

By William Osler, M.D.,

Professor of Medicine, Johns Hopkins University, Baltimore.

READ AT THE SEMI-ANNUAL MEETING OF THE MEDICAL AND CHIRURGICAL FACULTY
OF MARYLAND AT WESTMINSTER, NOV. 14TH, 1899.

IN the city, from the country or from small towns, I not infrequently see persons with pulmonary tuberculosis whose circumstances are such that change of climate or life in a sanitarium is out of the question; and when we reflect for a moment on the enormous number of cases of phthisis and the trifling accommodation offered in sanatoria, the practical problem which confronts us is, how best to treat the 95 per cent. of cases necessarily confined to their homes. Cannot these poor victims reap some benefit from the recent experience of the profession?

The usual surroundings of a consumptive are only too well known to all of us. In a majority of cases the treatment is desultory, unsystematic and directed to symptoms alone. It is not too sweeping an assertion to say that of the 8000 or 10,000 cases of consumption in the city of Baltimore today, few live under a definite regime. Last spring I saw in rapid succession two cases which impressed upon me forcibly the familiar fact that our theoretical knowledge of this disease has, as is so often the case, not reached a practical working basis. In a small house in South Baltimore I saw a young man, aged eighteen (one of five children), who had had tuberculosis for at least nine months. Nothing could have been more unfavorable than his surroundings, though the people were of the mechanic class, and of good intelligence. The room was stuffy, ill-ventilated, with both windows closely shut, and the temperature of the room, heated by a small stove, was nearly 80°. He had been in bed for at least three months, with much cough and a great deal of expectoration, some of which was visible on the floor, as it did not always reach the spittoon. He had high fever, loss of appetite, and was being fed on panopeptone and beef extracts. The room had a good exposure, and I suggested to the young man to have the bed moved to the window, to be well covered up, and to rest in the sunshine during part of every day. The reply was that it would kill him, and I could see by the mother's looks that she was of the same opinion. The doctor, too, I am afraid, regarded me as a fanatic. In the same week I saw a similar picture in a different setting, a young girl, who had been in bed for many weeks, with high, irregular fever and a rapidly-progressing disease. I could see that the suggestion of an open-air course of treatment was extremely distasteful, but she was induced to go to the Adirondacks, where she has done very well.

Arrest or cure of tuberculosis is a question entirely of nutrition, and the essential factor is so to improve the resisting forces of the body that the bacilli cannot make further progress, but are so hemmed in that they are either prevented effectually from breaking through the entrenchments, or, in rare cases, they are forced to capitulate and are put to the sword. Of the measures by which

the general nutrition of the body may be encouraged and improved, the first and most important is:

Fresh Air.—For more than two centuries the clearer-headed members of the profession have known that an open-air life sometimes cures a case of phthisis. One of the earliest and most interesting cases of this kind is reported by John Locke, the philosopher, in his "Anecdota Sydenhamiana." "Mr. Lawrence, Dr. Sydenham's Nephew after a fever fell into a Cough, & other signs of an incipient Phthisis, (the Morbific matter being violently translated in upon his Lungs) and at length the Diarrhoea colliquativa came on: then ye Dr sent him into ye Country on Horseback, (tho he was soe weak yt he could hardly walk) & ordered him to ride 6 or 7 miles ye first day, (wch he did) and to encrease dayly his Journey as he shd be able, untill he had rid 150 miles: When he had travelld half ye way his Diarrhoea stopt, & at last he came to ye end of his Journey, & was pretty well (at least somewhat better) & had a good appetite; but when he had staid at his Sister's house some 4 or 5 days his Diarrhoea came on again; the Dr had ordered him not to stay above 2 days at most; for iff they stay before they are recovered this spoils all again; & therefore he betook himself to his riding again, and in 4 days came up to London perfectly cur'd. The same course hath ye Dr put others upon, especially in Pulmonick Diseases, & wth ye like Success when all things elce had faild him: & he was not ashamed to own yt he was fain to borrow a cure from this way now & then when he found himself puzzled with some lingering Distemper not reducible to a common & known (sic) Disease."

This reminds one of Dr. H. I. Bowditch's description of the ride which did him so much good when as a young man he was supposed to have lung trouble.

The quality of the fresh air in our large cities may not be very good, but it is the best a large proportion of our patients can possibly get to breathe, and it is a great deal better than the atmosphere of the overheated, ill-ventilated rooms in which a majority of them live.

I give the following directions: Take the almanac and count off the hours of sunshine. In winter cut off two hours in the morning and an hour in the evening, and for the rest of the day the patient is to be out of doors. If there is no possible arrangement for life out of doors, the patient is to be in a room with a southern exposure with the windows wide open. The bed is to be moved into the sunshine. If there is a balcony or a veranda with a good outlook towards the south, it should be arranged for the patient; if not, a sheltered protection can be put up in the yard at a very moderate cost. On a well-padded lounge, covered with a couple of thick blankets, well wrapped up, the patient sits or reclines all day, coming in only to attend to the calls of nature. Only on blustering, stormy or very rainy days is the patient to remain in the house. No degree of cold is a contraindication. This continuous open-air life, at rest, is the most powerful influence we possess today against the fever of tuberculosis. It may take a month, it may take two or even three months before the temperature reaches normal, but it has been one of the many valuable lessons which we have learned from Dr. Trudeau, that in the fever of consumption the patient should not only be out of doors, but at rest, taking no exercise. The bedroom of the patient should be

thoroughly ventilated, and the patient should be accustomed gradually to sleep with the window open.

Secondly, *Food*.—The stomach controls the situation in pulmonary tuberculosis. In any long series of cases the patients who do well are those who can take plenty of food. An important cause of the lack of appetite and feeble digestion is the persistent fever, and we often find that as the temperature falls the appetite improves. It is easy to lay down rules; very hard to carry them out. Each case must be dealt with separately, but as large a quantity of food as possible should be given. Overfeeding or stuffing, when possible, should be practised, and the patient should be encouraged to pay as little attention to his subjective gastric sensations as possible. We rarely can carry out the autocratic, cast-iron method followed at Nordrach, which insists that a patient who has vomited a meal shall, *nolens volens*, eat another very shortly of the same character. For some time I have been urging the patients to accustom themselves to taking raw eggs, beginning with one three times a day, and increasing one a week until they took, if possible, twenty or twenty-four daily. For the hyperalimentation this is probably the simplest and most satisfactory diet. It has been carried out with marked success by Dr. Ely of Rochester, who literally prescribes eggs by the dozen. Broken into the egg-cup, sprinkled with a little pepper and salt, the egg can be readily swallowed without breaking the yolk. It is most important to get the patient accustomed to taking the natural foods. Milk and cream and butter, meat and eggs and oysters should constitute the main part of the diet.

The medicinal treatment of cases may be divided into—first, the use of stomachics, bitter tonics and certain digestives; secondly, remedies such as codliver oil, hypophosphites and creasote, the benefits of which are chiefly in promoting general nutrition, and, thirdly, remedies for the relief of certain symptoms, as cough, pain, night sweats, etc.

In December last a young woman came to me from one of the towns in the State with well-marked tuberculosis. Her grandmother and two of her father's brothers had died of consumption. She had a cough off and on for three years, and for more than a year she had a great deal of fever, had lost very much in weight and had had profuse night sweats. She never had had any vomiting. When I saw her she had high fever (temperature 103°), and there were signs of extensive disease at the right apex—flattening dullness on percussion with resonant rales as low as the fourth rib. There were signs of involvement of the right apex behind, and there were a few crackling rales at the apex of the lower lobe on the left side behind. She was short of breath, and looked thin and pale. Her weight was 109 pounds. I gave her directions such as I have indicated, and she has given me a brief statement in her own words of her progress in the eleven months. She writes as follows (November 10): "When I begun treatment the first day I sat out was December 11, 1898; don't know just how cold it was, but could see the river from our porch and they were skating. In winter usually had breakfast about 8 and went outdoors about 9. When I begun was not well enough to walk much, was so short of breath; after sitting out for some weeks would walk up and down porch an hour before sitting down. I spent a good deal of my time reading; became so interested in my book at times forgot how cold it was.

The first two weeks I took three eggs a day, one at 10 A. M., another at 3 and another before going to bed; then six a day, two at a time, and continued to increase till I got up to fifteen a day; continued that number for two months or more, then took twelve a day for three months, then nine. For breakfast I had oatmeal and cream and toast, or small piece of beefsteak and coffee; dinner at 12, drank one glass of milk and ate anything that was on the table in the line of meats or vegetables (provided I liked them); seldom if ever eat desserts. Went out immediately after dinner and remained there until sundown; more eggs at 3 and supper at 6; another glass of milk, and with that a small piece of meat, as a rule, and bread. Eggs again at 9, and go to bed between 9 and 10. Was sitting out one day when the thermometer registered 10° below zero. When it felt like snow or rain remained indoors. I kept this up till the weather was warm and then went driving, took eggs along and stayed out in country till dinner time; drove out again late in evening, and after my return home would sit out till after 10 o'clock. When I begun treatment had bad cough, expectorated a great deal and no appetite. The cough begun to get better, and after about four months I coughed very little; now, so rarely and expectorate so very seldom that it is hardly worth mentioning. When I consulted you last December weighed 109 pounds; now tip the scales at 132 pounds. I have improved steadily and gained in flesh gradually from the above date."

This very practical story illustrates what could be done by many patients. Last spring I happened to be in the town in which this girl lived, and I fortunately thought of her and paid her a visit. She lived in a small two-story house, with a narrow balcony on the first story behind, and here at half-past eleven one morning I found her carefully wrapped up. She looked a different girl, and the report indicates that she has done remarkably well. At the time of my visit she was without fever, but there were still numerous moist rales at the right apex.

Since writing the above I have seen this patient (December 1), who looks remarkably well, has a good color, is free from fever, has no cough, no expectoration and weighs 133 pounds. Luckily I dictated a note on the condition of the lung at the time of her first visit, otherwise I should not have believed the extent of the change. The resonance is still impaired, the flattening is marked beneath the right clavicle, the breath sounds are harsh, the expiration prolonged, but there are only a few dry crackling rales on coughing or on deep breathing. There were no signs at the apex of the lower lobe of the left lung behind.

Two additional points of interest may be mentioned. She has not had a doctor, and she has not had a dose of medicine except an occasional dose of paregoric for the cough. She took creasote for a short time, but afterwards gave it up. Shortly before she visited me her physician died, and I did not know, until my visit to her, that she had not been under any professional care. She could not have done better had she been at the Adirondacks under Dr. Trudeau.

A rigid regimen, a life of rules and regulations, a dominant will on the part of the doctor, willing obedience on the part of the patient and friends—these, with the conditions we have discussed, are necessary in the successful treatment of pulmonary tuberculosis.

C. D. Osh.

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On Splenic Anæmia.

BY

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FROM

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ON SPLENIC ANÆMIA.

BY WILLIAM OSLER, M.D.,

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UNDER the names of splenic pseudoleukæmia, anæmia splenica, lymphadénie splénique, and the splenic form of Hodgkin's disease is described an idiopathic enlargement of the spleen with anæmia. I prefer the name splenic anæmia, which indicates the two essential features.

From Griesinger's clinic, in 1866, Gretzel¹ described a case of enlargement of the spleen with anæmia in a child of ten months. Griesinger, who termed the condition anæmia splenica, had many such cases in adults which had terminated fatally. He recognized the condition as a non-leukæmic counterpart of the ordinary splenic leukæmia.

In 1871, H. C. Wood,² of Philadelphia, in a paper on the relations of leukæmia and pseudoleukæmia, brought the subject to the notice of the profession in this country. After speaking of the two forms of the latter, in which the lymphatics are involved alone, or the lymphatics with the spleen, he says: "I now desire to show that there is still a third form of pseudoleukæmia—a splenic variety. Under the names of tumor of the spleen, splenic cachexia, etc., from time far back, medical records furnish accounts of cases which I believe represent this affection." The case which he reported was very characteristic; the spleen was enormously enlarged and the anæmia extreme, without any increase in the leucocytes. Usually described with Hodgkin's disease or pseudoleukæmia, splenic anæmia has not received until lately widespread recognition. Thus while familiar with the papers of Wood, Strümpell and others, and although I had had cases under my care, I did not discuss the diseases in a separate section in Pepper's *System of Medicine*, 1885, vol. iii., but only referred to it under the differential diagnosis in pernicious anæmia and in leukæmia. The critical summary of the literature, by Dr. Sippy, in the November number of this JOURNAL (in which, by the way, Dr. Wood's paper is overlooked) makes superfluous any additional references to the literature of the subject. I give here, as briefly as possible, my experience with this condition, limiting the cases strictly to those which have presented a primitive splenomegaly and anæmia without enlargement of the lymph-glands.

¹ Berliner klinische Wochenschrift, Band iii.

² THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES.

I purposely have not spoken of anæmia with enlarged spleen in very young children, a subject which requires separate consideration.

CASE I. *Malaria in India some years previously; no syphilis; recurring attacks of hemorrhage from the stomach; enlarged spleen; progressive anæmia; ascites; death from hæmatemesis.*—This patient, a man, aged thirty-six years, was admitted to the Montreal General Hospital, September 2, 1879, with anæmia. He had a very much enlarged spleen, which extended to the navel, and the lower edge was below the transverse navel line. There was no enlargement of the lymph-glands. The red blood-corpuscles were under 2,000,000 per c.mm. The hæmoglobin unfortunately was not estimated. There was no leukæmia. He had served with the army in India, and had had intermittent fever. He had had recurring attacks of hæmatemesis. Two months before admission he began to have dropsy of the legs and abdomen.

CASE II. *Severe hæmatemesis at the ninth year, again at the eleventh year; anæmia; swelling of the feet; enlarged spleen.*—Girl, aged eleven years, seen August 13, 1879. Two years before she had had a very severe hemorrhage from the stomach, from which she recovered, though she remained somewhat pale. A month before I saw her she had a second attack, in which she lost, the mother said, nearly three quarts of blood in thirty-six hours. She was very anæmic. The red blood-corpuscles were 2,250,000; leucocytes, 7120 per c.mm.

These two cases were reported in full in the *Canada Medical and Surgical Journal*, vol. xi.

CASE III. *Recurring attacks of hæmatemesis and melæna between 1885 and 1897; excellent health in the intervals; chronic enlargement of the spleen; death in an attack.* *Anatomical summary:* *Chronic hyperplasia of the spleen; liver smooth, macroscopically showing no signs of cirrhosis; microscopically showing only fatty changes.*—W. M., aged thirty-five years, seen on December 9, 1892, complaining of hemorrhage from the bowels. This patient was very anæmic after each hemorrhage. When I saw him first he was only slightly anæmic. The blood was examined, but unfortunately the slip with the count was mislaid. There was no leucocytosis, no enlargement of the lymph-glands.

CASE IV. *No history of malaria or of syphilis; nearly ten years ago first attack of hæmatemesis; since then, at intervals of about a year, very severe attacks, in which he vomited blood and passed blood in the stools; enlarged spleen; exploratory laparotomy; stomach and duodenum normal; liver smooth, not cirrhotic; removal of enlarged spleen; recovery.*—C. D. B., aged thirty-three years, of Fincastle, Va., farmer, admitted on March 9, 1898, complaining of hemorrhages from the stomach and bowels, and pain, with enlargement in the left side of the abdomen. On his first admission, four months after the last hemorrhage, the red blood-corpuscles were 3,000,000, the leucocytes 2800 per c.mm., and hæmoglobin 25 per cent. Differential count: polymorphonuclears, 84.4 per cent.; small mononuclears, 4.4 per cent.; large mononuclears, 5 per cent.; transitionals, 3.4 per cent.; eosinophiles, 2.8 per cent. There was no enlargement of the lymph-glands. This patient has been heard from a year subsequent to the removal of the spleen, and he continues well.

CASE V. *No malaria; no syphilis; eleven years ago first attack of hæmatemesis; for four or five years recurring attacks of melæna; in 1892*

second attack of hæmatemesis; an occasional attack of melæna; January, 1898, severe hæmatemesis and melæna; great enlargement of the spleen; marked anæmia of the chlorotic type—A. B., aged thirty-eight years, of Durham, N. C., admitted to Ward C, on November 10, 1898, complaining of hemorrhages from the stomach. In this very remarkable case the hemorrhages have recurred for nearly twelve years, as I have heard within a few weeks (November, 1899) that he has had another severe attack. He had been persistently pale for many years. The blood on admission gave hæmoglobin 30 per cent.; red blood-corpuscles, 4,000,000; leucocytes, 6500 per c.mm. Differential count: polymorphonuclears, 73; small mononuclears, 10; large mononuclears, 12; transitionals, 3; eosinophiles, 2.

Cases III., IV., and V. have been reported in full in the *Edinburgh Medical Journal*, May, 1899.

CASE VI. *Hæmatemesis and melæna in April, 1898; enlarged spleen; second attack of hæmatemesis in October, 1889; swelling of abdomen and feet; melanoderma*.—W. H., aged twenty years, admitted to Ward F, January 14, 1890, complaining of swelling of the abdomen.

Family History. Mother died, aged forty-six years, of disease of the lungs; father died at thirty years, cause unknown; one brother has had malarial fever.

Personal History. Until 1887 he lived at Centreville, Md., which is in a malarial district. For the past five or six summers he has had attacks of what was called bilious fever, with vomiting for a few days, but no jaundice or pain. The first attack was the most severe, and in it he became very pale and sallow, and had œdema of the legs. He does not think he has ever had malaria; he is sure that he has never had ordinary ague.

In April, 1889, after feeling wretchedly for a month, he vomited a good deal of blood, and passed dark blood in the stools. He was in bed at this time for three or four weeks. In May there was first noticed an enlargement in the left side of the abdomen. In June the patient applied at the out-patient department, complaining of uneasy feelings in the abdomen, headache, and weakness. At that time the spleen was noticed to be very large, and the notch was distinctly felt. He got better throughout August and September, and was able to work for three weeks. Early in October he had a second and more severe attack of vomiting of blood. This recurred on three successive days. It was dark-colored, and the stools again became bloody as before. He had slight fever, headache, and increasing swelling of the abdomen and of the feet.

On admission the patient had a very remarkable mottling of the face, with brown pigment. There was a good deal less pallor than when he was seen in June. There was a general brownish discoloration of the skin everywhere; no pigmentation of the mucous membranes. The conjunctivæ were very pearly. The examination of the abdomen showed a greatly enlarged spleen, which toward the middle line reached to within an inch and a half of the umbilicus, and below to within three inches of the crest of the ilium. It was smooth and not painful. The liver was not enlarged. The superficial lymph-glands were not enlarged.

Blood. On admission, January 14th, the red blood-corpuscles were

2,187,000; leucocytes, 12,497. There were no microcytes, no poikilocytosis. He was placed upon Fowler's solution, and he improved rapidly. The color got better, and on January 23d the red blood-corpuscles had risen to above 3,000,000. He progressively improved, and on February 5th the red blood-corpuscles were 3,912,500 and the leucocytes 18,720. He left the hospital on March 24th greatly improved, his weight having risen from 140 pounds on admission to 154 pounds. While in the hospital he had slight fever— 99° to 100° , and it once rose to 102° . I have not been able to learn the subsequent history of this case.

CASE VII. Residence in a malarial district; no attacks; no syphilis; progressive enlargement of the spleen, with anæmia; melanoderma.—W. R., aged forty years, of Port Antonio, Jamaica, referred to me on May 18, 1895, by Dr. Henderson, of Kingston.

Personal History. A native of Jamaica, he had malaria when a boy, and has lived in Port Antonio and the neighborhood for some years (which is a very malarial district), but has never had chills or fever, and has never been laid up in bed. He has at times had slight feverish attacks. He has not had syphilis.

The present trouble dates from about two years ago, when he began to get pale and lost his weight—from about 165 to 148 pounds. He has worked steadily until April of this year, when he consulted Dr. Henderson, of Kingston. The doctor writes that he found him suffering from anæmia, with considerable enlargement of the liver and great increase in the size of the spleen, which came down nearly to the iliac crest, and extended inward to within one inch and a half of the umbilicus.

Present Condition. Patient was remarkably bronzed on the face and hands, and there was a diffuse pigmentation of the whole skin. The mucous membranes were not anæmic; not pigmented. There was an old scar on the left ankle, and a small fresh abrasion on the right shin, in the neighborhood of these there were remnants of extensive fresh hemorrhages; a similar very large one existed over the dorsum of the left foot. He said there had been recurring hemorrhages in the skin of the legs. The pulse was steady and strong—80 to the minute. The heart-beat was in the fourth interspace; the sounds were everywhere clear.

The abdomen was prominent. An enormous spleen occupied almost the entire left side, extending to within three finger-breadths of the pubes and about two finger-breadths beyond the middle line, just below the navel. The lower and anterior borders were felt readily; the notch was just at the navel. The surface was smooth; pressure was not painful. The flatness extended to the upper border of the eighth rib in the mid-axillary line. The liver was not so much enlarged as at the time of Dr. Henderson's examination. It extended only two finger-breadths below the costal margin in the nipple line.

Blood count (Dr. Thayer): red blood-corpuscles, 4,816,000; white blood-corpuscles, 5000; hæmoglobin, 55 per cent. There were no nucleated red blood-corpuscles; there was no poikilocytosis. The large mononuclear elements were more numerous than the small; the eosinophiles were also slightly increased.

CASE VIII. Recurring attacks of diarrhœa; tumor in the left side noted three years ago; no hemorrhages; progressive anæmia, with greatly enlarged spleen.—Mrs. Phœbe N., aged fifty-six years, admitted on

October 15, 1896, complaining of diarrhœa and swelling of the abdomen. There was nothing of any moment in her family history. She has had six children; has always been very well and strong. She has not had malaria.

She dates her present illness from three years ago, when, after an attack of diarrhœa, she noted a swelling in the left side beneath the costal margin. From the onset she noticed that her color was bad, of a grayish-brown, unhealthy tint. The diarrhœa had been a very persistent feature in her case, and she had to exercise the greatest caution in diet, and sometimes had as many as six to twelve greenish-watery stools in the twenty-four hours. She has never passed any blood or mucus. There had been intervals of from one to three weeks when the diarrhœa would stop entirely. The tumor which she had felt in her left side had increased, and it caused a dragging, uneasy sensation. She has had no hemorrhages, no œdema, no ascites.

Present Condition. The patient was a small woman, not specially emaciated, but of a very pale, gray, pasty-brown color; mucous membranes pale; tongue slightly coated; no special pigmentation. There were hæmic murmurs at the base of the heart.

The abdomen presented a marked prominence on the left side and a bulging just to the left of the umbilicus. This area was occupied by a large solid mass, with sharp border and two well-defined notches, one above the navel and one a little to the right and below. The whole mass was readily movable on bimanual palpation. On percussion the flatness extended from the sixth rib in the nipple line.

Blood. Hæmoglobin, 60 per cent.; red blood-corpuscles, 3,600,000; white blood-corpuscles, 3000 per c.mm. There was a slight poikilocytosis; the corpuscles looked pale. No nucleated red blood-corpuscles. A differential count of the leucocytes gave: polynuclears, 66; small mononuclears, 25; large mononuclears, 7; transitionals, 2; eosinophiles, 1.

The feces were of a greenish-brown color, contained no blood, no mucus, no parasites, no ova of parasites. They were repeatedly examined.

The patient remained in the hospital until October 21st. She improved; the red blood-corpuscles rose to 4,300,000, hæmoglobin 60 per cent., leucocytes 6000 per c.mm. There was no change in the differential count of leucocytes. The urine had a specific gravity of 1022; contained no tube-casts or albumin. The patient had no fever during her stay in the hospital.

CASE IX. Chills and fever when a child—febrile attacks in 1892, six years before death, in which enlargement of the spleen was noticed; gradual anæmia; in May, 1895, ascites; recovery; in May, 1897, again ascites; recovery; progressive anæmia; greatly enlarged spleen; early in 1898 again ascites; repeated tapplings; death; spleen enormously enlarged; no cirrhosis of the liver.—D. S. C., aged fifty-eight years, a physician from Illinois, consulted me on October 29, 1897, complaining of anæmia and an enlarged spleen. He had had chills and fever as a child of seven, inflammatory rheumatism at ten years of age. In 1872 had a bad attack of erysipelas. He has been a temperate man and a very hard worker.

The present illness began in the winter of 1892–1893 with a fever, which recurred at intervals for six weeks, but which seemed to be

checked easily with doses of quinine and atropine. He did not feel very ill and kept at work. Toward the end of this attack there was a slight swelling and redness of the right ankle. He noticed now for the first time that the spleen was enlarged, but it was not very prominent. In 1893 and 1894 "he worked along," not feeling very robust, and he thinks that the spleen continued enlarged all this time. In May, 1895, he became very anæmic and weak, and, not improving through the summer, he gave up work for eight months. In this attack, in addition to the anæmia and enlargement of the spleen, he had ascites. In January he felt better and went home and began work again, and continued to practice during the winter of 1896-1897. He says the spleen was at this time enlarged. In May of that year he again became very anæmic and pale, and took much iron and arsenic. The abdomen also became swollen, but was not so large as in 1895, and he had œdema of the feet; both disappeared. The blood count, which he had made at that time, showed 4,400,000 red blood-corpuscles; 5100 white blood-corpuscles per c.mm.

Present Condition. He looked a little pale, was not specially emaciated. Tongue was of good color, pulse of good volume, superficial bloodvessels not specially full.

The abdomen was large and the navel projected, and to the left of it there was a very marked prominence, which descended with each inspiration, and in it a distinct notch could be seen. A second prominent mass was seen just below the left costal margin. On palpation these two masses were found to be continuous, evidently a very greatly enlarged spleen, firm and hard, with rounded edges; the notch, which was visible, could be readily felt. The edges were singularly rounded; the surface was smooth. The edge of the liver could be felt just two finger-breadths below the costal margin outside the right rectus. The outlines on percussion did not show any enlargement. There was a small ecchymosis just to the left of the navel; the superficial veins were not distended; the superficial glands were a little enlarged.

Blood (Dr. Fitcher): moderate poikilocytosis, slight increase in the average size of the red corpuscles, a few microcytes and macrocytes, apparent diminution in the number of leucocytes. Blood count: red blood-corpuscles, 4,788,000; white blood-corpuscles, 5200; hæmoglobin, 60 per cent. The percentage of the different leucocytes was as follows: Small mononuclears, 52; large mononuclears, 2; transitionals, 4.8; polynuclears, 40; eosinophiles, 1.2. In stained specimens the same poikilocytosis was noted, and variations in size, as in the fresh specimens. There were no nucleated red blood-corpuscles.

On January 4, 1898, the swelling became so great that he had to be tapped, and an enormous quantity of fluid was withdrawn. The operation was repeated again in four weeks. Early in February he had a very severe attack of sciatica, hiccup developed, and he became greatly enfeebled. He sank gradually, and died on the 12th of February. The spleen was enormously enlarged. There was no cirrhosis of the liver.

CASE X. Residence in a malarial region; occasional attacks of chills and fever; chancre, no symptoms; progressive weakness and anæmia; epilepsy for years; greatly enlarged spleen; anæmia; melanoderma.—Cornelius B., aged thirty-nine years, of Port Royal, S. C., admitted to Ward C, June 15, 1898, complaining of epilepsy, hemorrhages, and progressive weakness. There was nothing of any moment in his family

history. He has always lived in a malarial district, and nine years ago had two congestive chills, and following this for three years he had occasional attacks of malarial fever. He had gonorrhœa ten years ago, and a non-indurated sore three years ago, not followed by symptoms. For five or six years he has had hemorrhoids. He is a moderate drinker. He has had epilepsy for nearly eighteen years; the attacks now recur about once a month. The patient has been growing progressively weaker for the past six or eight months. He has never noticed anything in the abdomen. He came to consult me, complaining of epilepsy and a nervous breakdown.

Present Condition. His face had a sallow look, which he attributed to his occupation, as he had been out in the open air fishing a great deal. The lips and mucous membranes had a good color. The general surface of the skin had a slight degree of dark brownish pigmentation, with here and there little patches of leucoderma. His weight was 138 pounds. He had no fever, and the pulse was of good volume, 92 per minute. The superficial lymph-glands were easily palpable, perhaps in places a little enlarged. With the exception of a soft apex systolic murmur there was nothing of note in the examination of the chest.

Abdomen. The spleen was greatly enlarged, reaching 7 cm. below the costal margin in the parasternal line. Above the flatness began in the sixth interspace; anteriorly the margin could be felt close to the navel. The edge was sharp, easily felt, the surface smooth and painless. The liver flatness began at the fifth space in the nipple line, and extended $3\frac{1}{2}$ cm. below the costal margin, 12 cm. in vertical extent. The edge of the organ was distinctly palpable and felt normal.

Blood. A fresh specimen showed considerable poikilocytosis, with megalocytes and microcytes; no nucleated red corpuscles were seen. There were no malarial organisms and no pigment. Blood: red blood-corpuscles, 4,128,000 per c.mm.; white blood-corpuscles, 2800 per c.mm.; hæmoglobin, 45 per cent.

The urine was of a low specific gravity, 1010 to 1014; there were no tube-casts, no albumin.

The patient remained under observation for two weeks, during which time he improved, and was then transferred to the surgical side for operation on the hemorrhoids.

An interesting point was the fact that this patient did not know that his spleen was enlarged. He had had no treatment, and consulted me for the epilepsy.

CASE XI. In 1891 obscure abdominal attack, thought to be peritonitis; color not good since; April, 1898, spleen found to be greatly enlarged; progressive anæmia; persistent enlargement of the spleen; stone in the bladder; operation; death.—J. K. E., aged fifty-seven years, seen early in September, 1898, with Dr. Graham, of Toronto, and he was under my subsequent care through January and February, 1899. The patient has always been a strong, healthy man, high-strung and nervous, actively engaged in political and legal work. His habits have been good; he has taken alcohol in moderation; has never been what would be termed a heavy drinker. In 1891 he had an obscure abdominal attack, the nature of which was never very clear. His doctor at that time thought it was possibly peritonitis. He does not think that he has ever been quite the same since, particularly in the matter of color, though he has of late years been able to attend to a great deal of work. In the early

part of 1898 his wife and others noticed that he was becoming very pale, and in April he discovered that he had a lump in the left side of the abdomen. The first blood count was made in June by Dr. Harold Parsons, when the hæmoglobin was found to be 37 per cent. and the red blood-corpuscles somewhat under 2,500,000; the leucocytes were normal. Throughout the summer he did not do well. The pallor persisted; he had a little swelling of the feet, and he also had dyspepsia. In August, a little before I saw him, he had 45 per cent. of hæmoglobin, and the corpuscles were rather more than two millions and a half; leucocytes normal. In September, when I examined him with Dr. Graham, the pallor was marked; he had lost about fifteen pounds in weight. The spleen was considerably enlarged, extending more than a hand-breadth below the costal margin. The superficial glands were not enlarged; liver was not enlarged. Dr. Graham regarded the case as one of anæmia splenica, in which opinion I concurred. All through the summer he had at intervals attacks of slight fever; sometimes the temperature would go as high as 101° ; more frequently it would be an afternoon temperature of 100° .

On admission to the private ward there was no special change since I saw him in September; no loss in weight. Pulse was 72, regular, good tension. The abdomen looked full in the left flank and under the left costal margin. The spleen extended to about the level of the navel, to the right about three finger-breadths from the middle line; it felt round and firm; the notches were not distinct. It extended deep in the flank below the level of the anterior superior spine. The edge of the right lobe of the liver was readily felt just below the costal border on deep inspiration; left lobe of liver could also be felt two finger-breadths below the ensiform cartilage. There was no enlargement of the superficial lymph-glands.

Repeated very careful blood counts were made in this case by Dr. McCrae through January and February. The hæmoglobin was at about 40 per cent. It rose on February 10th to 50 per cent. On January 15th and 29th it was 40 per cent. The red blood-corpuscles were 3,328,000 per c.mm. on the 15th, and they had gained only a few hundred thousand on February 10th. The highest leucocyte count was 4000 per c.mm. on February 4th. On January 29th it was 2000. The differential count was as follows: Polynuclear, 78; small mononuclear, 6; large mononuclear, 13; transitional, 2.5; eosinophiles, 0.5 per cent. There was no poikilocytosis, but an occasional nucleated red blood-corpuscle was seen.

The patient improved somewhat through the spring, then symptoms of stone came on. Death followed the operation of lithotomy.

CASE XII. *Dyspepsia for many years; July 9, 1899, profuse hemorrhage from the stomach, again on the 16th and 26th; marked anæmia; ascites; paracentesis; greatly enlarged spleen.*—L. F. W., aged forty years, was referred to me on October 18, 1899, by Dr. Moran, of Roxbury, Mass. Up to eight years ago he was a very healthy man. He had not had malaria. No history of syphilis. Had been a temperate man. For the past eight years he had had dyspepsia, and on several occasions had vomited. He had had no pain, and had kept at work. During the first week of July of this year he did not feel very well; then on the evening of July 9th he had a profuse hemorrhage from the stomach, in which he brought up, he says, four quarts in three separate

attacks. On the 16th he had a second hemorrhage, and on the 26th two more, one of which was very severe. Naturally the bleeding was thought to come from an ulcer, and he was kept very quiet and had rectal feeding for many weeks. He gradually began to improve, although he was very weak and debilitated. The abdomen became progressively larger, owing to dropsy, and he was tapped about five weeks ago, and six quarts of fluid drawn off. On his way to join relatives in Baltimore he consulted Dr. Vickery, of Boston, who found a greatly enlarged spleen.

Present Condition. He was not emaciated; still looked pale. The abdomen was full, and under the left costal border there was a slight prominence. On palpation the spleen was found to be greatly enlarged, the lower border extended exactly to the level of the navel. Anteriorly it reached to the parasternal line. The border could be distinctly felt. The liver was not enlarged. The ankles were not swollen. There was a soft hæmic murmur over the base of the heart. There were no retinal hemorrhages.

Blood. Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,208,000; white blood-corpuscles, 4000 per c.mm. A differential count of 300 white blood-corpuscles gave: polynuclears, 65.6 per cent.; small mononuclears, 15 per cent.; large mononuclears, 12.6 per cent.; transitional, 3.3 per cent.; eosinophiles, 3.3 per cent.; no nucleated red blood-corpuscles or myelocytes were seen.

CASE XIII. *Failing health; vomiting and diarrhœa; profound anæmia; greatly enlarged spleen; rapid improvement under treatment.*—Mrs. C., aged forty-four years, colored, laundress, admitted to Ward O, on October 12, 1899, complaining of great weakness, nausea, and vomiting. Her husband died of tuberculosis. She has three children, one now tuberculous. She has had the usual disorders of childhood; has never had typhoid fever or malaria. She has had no miscarriages. She has had indigestion all her life; has been a hard-working woman, and has had to support her children for many years.

Present Illness. For the past three months she has been failing in health; has had loss of appetite, progressive weakness, and for the past six weeks much nausea, vomiting and diarrhœa. She gave up work about September 1st, and has been in bed ever since. She has felt giddy at times, and her eyesight has been dim. She has lost about fifteen pounds in weight. She has been short of breath on the slightest exertion.

She was a slenderly-built, fairly well-nourished, light mulatto woman; the mucous membranes very pale. There were all the objective features of extreme anæmia.

The abdomen looked full and prominent, particularly in the left half, and the left subcostal groove was obliterated. On palpation a large tumor was felt in the left hypochondriac region, extending into the epigastric region as far as the middle line. The border reached 7 cm. from the left costal margin. The edge was rounded. On bimanual palpation the mass could be grasped between the hands, and the posterior edge could be well felt. The surface was smooth, and there was no pain. There was no friction over it; no bruit. The liver flatness began at the sixth rib, and extended 7 cm. below the costal margin in the nipple line. The edge of the left lobe could be well felt 5 cm. above the navel. The surface was smooth. The superficial lymph-

glands were not enlarged. The posterior cervicals were perhaps a little larger than normal. No retinal hemorrhages.

Blood. Hæmoglobin, 23 per cent.; red blood-corpuscles, 1,540,000; white blood-corpuscles, 3300. Differential count of 300 leucocytes gave: polymorphonuclears, 74; small mononuclears, 19.6; transitionals, 2.6; large mononuclears, 1.6; eosinophiles, 1.5; myelocytes, 1.5; forty-five nucleated red blood-corpuscles were met with in counting 300 leucocytes, thirteen of which were megaloblasts. (Miss Reed.)

On October 17th a blood count was made by Dr. McCrae. Hæmoglobin, 20 per cent.; red blood-corpuscles, 1,380,000; white blood-corpuscles, 3250. Differential count showed no special changes from that previously noted. In 400 leucocytes there were 1.25 per cent. myelocytes. In counting the 400 leucocytes there were 75 nucleated reds, 21 of which were normoblasts, 19 megaloblasts, and 35 intermediate. There was very marked poikilocytosis. There were some enormous nucleated red blood-corpuscles 12×15 microns in diameter.

The patient was kept in bed, had a good diet, was put out of doors every day, and given arsenic and iron. She improved with great rapidity, gaining in weight and in strength.

A very careful study of the blood was made in this case by Miss Reed, and counts were taken twice a week. On November 10th the following: Hæmoglobin, 55 per cent.; red blood-corpuscles, 3,120,000; leucocytes, 4500. No nucleated red blood-corpuscles were seen. The most remarkable change was in the reduction of the size of the spleen, the edge of which was now felt 5 cm. from the middle line. She had increased in strength, her color was good, and she had gained thirteen pounds in weight.

The patient was discharged November 20th. The hæmoglobin was 54 per cent.; red blood-corpuscles, 3,680,000; white blood-corpuscles, 4300.

CASE XIV. *Enlarged spleen; anæmia of chlorotic type; recurring attacks of hæmaturia; melanoderma; diarrhœa.*—E. W. S., aged thirty-five years, lawyer, of West Virginia, seen with Dr. Thayer and admitted to Ward C, October 31, 1899.

His family history was good. When fifteen years old he had typhoid fever, and following it a great deal of rheumatism. At eighteen he had a primary sore, followed by pharyngitis and skin rash. He was very thoroughly treated. He is married and has three healthy children.

Until five years ago he was well. In the summer of 1894 he had an attack of diarrhœa, which lasted on and off for several weeks, and at this time he first noticed a sallowness of the complexion, and he had itching of the skin. In the following summer he had a return of the diarrhœa, but less intense, but with it the itching of the skin returned. He does not think that he was jaundiced. In the summer of 1896, while electioneering, the diarrhœa returned, and persisted on and off through the winter and spring, and through the summer of 1897. Then until July, 1898, he was quite free from it. He then had it for nearly four months. Last winter he was well until March, when the old trouble began, and since then he has lost forty pounds in weight. During these five years the movements have always been the same, watery at first, followed by much mucus, and at the end of the movement a little fresh blood. Parasites have been carefully looked for by Dr. Thayer on several occasions.

In the intervals between the attacks of diarrhœa he regained strength

quickly. The sallowness year by year became more marked. During the past summer for the first time he had three attacks of hæmaturia, each one followed by colic; no rigor; no fever. He was considered to have malaria, and given quinine. He had no hemorrhages from the stomach or bowels. He has never lived in a malarial region; has never had a chill. He had taken much arsenic during his illness.

Blood. Hæmoglobin, 55 per cent.; red blood-corpuscles, 3,856,000; white blood-corpuscles, 4500. Differential count: Polymorphonuclears, 73.7; small mononuclears, 14; large mononuclears, 8; transitionals, 3.3; eosinophiles, 1. No nucleated reds, no myelocytes. In the fresh specimen the red blood-corpuscles looked rather pale, slight poikilocytosis, numerous endoglobular degenerations; no malarial parasites.

The pigmentation of the skin was fairly uniform on the face. On the trunk it was deepest in the groins and flanks, the folds of the arms and in the axilla. There was some roughness of the skin and ankles; no nodes.

Abdomen. A prominent mass below the left costal margin descended with inspiration, reaching almost to the navel. On palpation this corresponded to a greatly enlarged spleen. The notch was not very distinct. The splenic dulness began at the upper border of the seventh rib. There was no enlargement of the lymph-glands. The liver was slightly enlarged. In the parasternal line it could be felt 6 cm. below the costal border. The edge could be felt. He had had no pain in either liver or spleen. The heart and lungs showed no special signs. The stools contained fatty debris and a few small blood clots; no parasites. There was no fever.

The patient remained in the hospital until November 23d. He was out of doors, in bed, all day, and improved rapidly. The diarrhœa stopped; he took his food, and seemed very comfortable.

On November 16th: hæmoglobin, 60 per cent.; red blood-corpuscles, 3,692,000; white blood-corpuscles, 3500 per c.mm. The spleen seemed to have reduced somewhat in size.

On November 19th he had an attack of hæmaturia which continued for nearly thirty-six hours; no pain. He passed several long clots. On the morning of November 21st the urine was perfectly clear.

The patient left on the 22d. There was no essential change in the condition of the blood. The hæmoglobin was between 55 and 60 per cent. No nucleated red blood-corpuscles were seen at any time. A portion of skin was excised in this case. The pigment was distributed in the cells of the corium and in the subcutaneous tissue. It gave no iron reaction.

CASE XV. Recurring hemorrhages from the stomach in 1891 and 1892; some abdominal pain; enlarged spleen; anæmia.—John F., Pennsylvania farmer, aged forty-three years, was seen on November 18, 1899, complaining of pains and uneasy sensations in the abdomen. He was at the hospital on October 8, 1895.

His family history was good. His personal history was excellent. He had had typhoid fever twenty years ago. He was a temperate man; said that he did not drink at all. Has not had syphilis. He has had psoriasis from his eighteenth year. He had fever and ague in 1885 when in Ohio. For two or three years he has had dyspepsia.

About Christmas, 1891, he vomited a large quantity of blood, as much as half a gallon. On January 1, 1892, he had a second hemor-

rhage, again bringing up about half a gallon. These attacks left him very anæmic and exhausted. In August, 1892, he had two profuse hemorrhages from the stomach, six days apart. At that time a lump was noticed in the abdomen.

At his first visit, in 1895, he was examined by Dr. Thayer, who found a spleen which reached 10 cm. below the costal margin, and in which two notches could be felt. The liver-dulness began on the seventh rib, and the vertical area seemed reduced. The border of the liver could be felt below the costal margin.

November 18, 1899. The patient returned to-day for the first time. He has remained in good condition, has never had any return of the hemorrhages, but has had more or less uneasiness in the abdomen, sometimes pain in the left side. He was robust, well nourished, looked a little pale. The abdomen was protuberant. There was no pigmentation of the skin. On examination the left side of the abdomen looked prominent, and on palpation the spleen was felt extending into the umbilical region, to within an inch of the navel, and below reaching nearly to the crest of the ilium. The notches could be plainly felt. It was not painful. The liver seemed slightly reduced in volume since the first examination. The edge, which could be felt, appeared normal. The blood examination showed: Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,270,000; leucocytes, 2500. Differential count: Polymorphonuclears, 80.3; small mononuclears, 8; large mononuclears, 4; transitionals, 2; eosinophiles, 5; mastzellen, 6.

From a study of this series I find nothing to throw light on the nature or origin of the anæmia, which remains quite as obscure as in pernicious anæmia, as in the latter disease males appear to be more frequently affected than females—twelve to three in this series. With one exception all of the cases were in adults above the age of thirty-five. The youngest was a girl of eleven years. Three of the patients were above fifty years of age. Four patients had had malaria. Case IX. had chills and fever when nine years old. Only in Cases VII. and X. is this disease a possible factor, as the patients had lived all their lives in very malarial regions. Locality has nothing to do with the number of cases here reported. Only four of the patients were natives of Maryland; three came from Canada, and the others from various States. Two of the patients had had syphilis. In four dyspepsia was a special feature, and in two there had been recurring attacks of diarrhœa of great severity.

CLINICAL FEATURES. Before referring to these we may speak of one of the most interesting points brought out by this series—namely, the long duration of the affection. Samuel West, in the article on “Anæmia Splenica” in Allbutt’s *System*, states that the disease is not of long duration—from six months to two years. In several of the cases the symptoms had lasted more than five years. Case V. has probably had the condition for at least twelve years, and in Case XV. the spleen was as much enlarged four years ago as it is now.

The Spleen. In all the enlargement of the spleen appears to have

preceded the anæmia. The patient suffered no inconvenience from it, and, as a rule, until discovered by the physician, did not know of its existence. In one case there were recurring attacks of pain in the region of the spleen. In all the spleen was large, reaching nearly to the navel, but only in Case VII. was it of maximum size, equalling the largest spleen of leukæmia. No case presented any difficulty in the diagnosis of the character of the tumor in the abdomen.

Hemorrhages. I have already called attention to the remarkable attacks of hæmatemesis in cases of enlarged spleen, whether simple or in leukæmia.¹ In the series here reported eight had hemorrhage from the stomach, and usually after it malaria. In seven cases this was the feature for which the patients sought relief. In Case V. the hemorrhages have recurred over a period of twelve years. Watson's explanation of the hæmatemesis in enlarged spleen is probably the most correct. "The stress of the congestion is continually felt in the submucous capillary system, and the hemorrhage, which is apt in such cases to occur from the loaded membrane, receives a simple solution upon principles almost purely mechanical." The vasa brevia, passing from the fundus, which empty into the splenic vein, drain a large section of the stomach. From estimates of Mall and Krauss 40 per cent. of the blood of the splenic artery goes to the stomach, so that one may reasonably conclude that a similar percentage of blood in the splenic vein is derived from that organ. The amount of blood brought up may be enormous, and the patient may be rendered exsanguine. Only in Cases I. and III. did the fatal termination follow hemorrhage. In a majority of the cases the diagnosis of ulcer of the stomach has been made. Hæmaturia occurred in Case XIV. It was probably not connected with stone, as it never came on with colic, but on several occasions was followed by pain and the passage of moulds of the ureter. Case VII. had on several occasions purpuric attacks.

Ascites, which was present in three cases, may be due, as in leukæmia, directly to the enlarged spleen, or it may be in part associated with the anæmia. It is important to bear in mind that ascites does not necessarily indicate cirrhosis of the liver. In Case IX. the patient had three severe attacks of ascites, and the liver at autopsy showed no trace of cirrhosis.

Lymphatic Glands. In no case in the series were the external lymphatic glands specially enlarged.

Anæmia. The patient may present only a very slight pallor, but there may be all grades of anæmia to a form as intense as that met with in progressive pernicious anæmia (Case XIII.). At least one-half of the patients when they came under observation did not present the

¹ Canada Medical and Surgical Journal, vol. xi., and Edinburgh Medical Journal, May, 1899.

objective features of a very profound anæmia. One of the most striking features on first inspection was the melanoderma, which was present in six cases. In Case VII. the pigmentation was as dark as in the most advanced cases of Addison's disease. In Case XIV. a portion of the skin was examined and showed none of the ochre-brown pigment of hæmachromatosis. In some of the cases the pigmentation may have been arsenical.

Blood. The following are the most striking features of the blood in this series :

1. The relatively high blood count: Of the fourteen cases the corpuscles ranged above 4,000,000 per c.mm. in six cases; between three and four millions in three; under three millions in four, and below one million in only one case. The average blood count of the fourteen cases was 3,336,357 red blood-corpuscles per cm.

2. The relatively low hæmoglobin: The estimate was not made in four cases; in the remaining eleven the ratio of hæmoglobin to corpuscular richness was low. In Case XIII. the hæmoglobin was 23 per cent., with the corpuscles above 30 per cent.; and in Case IV. the hæmoglobin was 25 per cent., with corpuscles at 60 per cent. Of the six counts in which the corpuscles were above four millions (80 per cent.) the hæmoglobin was 45 per cent. in three, 30 in one, 55 in one, and 60 per cent. in one.

3. The low leucocyte count: Of the thirteen cases in which the leucocytes were estimated there were nine with white blood-corpuscles below 5000 per c.mm. In six cases extreme leukopenia existed. In one case the count was 12,497.

The following table gives the result of the blood examinations in the series :

Case I.—Hæmoglobin, — per cent.; red blood-corpuscles, 2,000,000; white blood-corpuscles, —.

Case II.—Hæmoglobin, — per cent.; red blood-corpuscles, 2,250,000; white blood-corpuscles, 7120.

Case III.—No count.

Case IV.—Hæmoglobin, 25 per cent.; red blood-corpuscles, 3,000,000; white blood-corpuscles, 2800.

Case V.—Hæmoglobin, 30 per cent.; red blood-corpuscles, 4,000,000; white blood-corpuscles, 6500.

Case VI.—Hæmoglobin, — per cent.; red blood-corpuscles, 2,187,000; white blood-corpuscles, 12,497.

Case VII.—Hæmoglobin, 55 per cent.; red blood-corpuscles, 4,816,000; white blood-corpuscles, 5000.

Case VIII.—Hæmoglobin, 60 per cent.; red blood-corpuscles, 3,600,000; white blood-corpuscles, 3000.

Case IX.—Hæmoglobin, 60 per cent.; red blood-corpuscles, 4,788,000; white blood-corpuscles, 5200.

Case X.—Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,128,000; white blood-corpuscles, 2800.

Case XI.—Hæmoglobin, 37 per cent.; red blood-corpuscles, 2,500,000; white blood-corpuscles, 3000.

Case XII.—Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,208,000; white blood-corpuscles, 4000.

Case XIII.—Hæmoglobin, 23 per cent.; red blood-corpuscles, 1,540,000; white blood-corpuscles, 3300.

Case XIV.—Hæmoglobin, 55 per cent.; red blood-corpuscles, 3,856,000; white blood-corpuscles, 4500.

Case XV.—Hæmoglobin, 45 per cent.; red blood-corpuscles, 4,270,000; white blood-corpuscles, 2500.

Some additional points may be referred to.

Red Blood-corpuscles. Poikilocytosis was present in five cases. Marked endoglobular degeneration was noted in two cases. Nucleated red blood-corpuscles were met with in two cases; in Case XIII. in enormous numbers, both normoblasts and megaloblasts.

White Blood-corpuscles. As already mentioned, marked leukopenia was present in six cases. Differential counts of the leucocytes were made in ten of the cases. In the following cases there were changes in the proportion of the large and small mononuclears; in Case VII. the large mononuclears were more numerous than the small; in Case VIII. the small mononuclears were 25 per cent.; in Case IX. the small mononuclears were very high, 52 per cent.; in Case XIII. the small mononuclears were 19 per cent.; in Case XIV. the small mononuclears were 14 per cent. Altogether there was nothing in the differential count of any special moment or significance.

DIAGNOSIS. I have considered in this series only cases which presented idiopathic enlargement of the spleen (primitive splenomegaly) with anæmia and without enlargement of the lymph-glands. In this locality enlargement of the spleen from malaria is exceedingly common, and it will be noted that there is no case included which could be called paludal cachexia. I have not included a few cases of idiopathic enlargement of the spleen in persons who appeared perfectly healthy and in whom this was found accidentally, or in whom the organ was enlarged and dislocated. Two cases presenting this latter condition have been operated upon by my colleague—Halsted—who packed the spleen into position with gauze. Both were seen more than two years subsequent to the operation, and had remained perfectly well. In a third case, a young woman with an enlarged and floating spleen had a twist of the pedicle with necrosis of the organ and intense splenitis. Dr. Halsted operated, scraped out a large quantity of necrotic material, and she made a good recovery.

The following conditions are those in which there has been in my experience a difficulty in the differential diagnosis.

(a) From *pernicious anæmia*. In Case XIII., for example, in which the spleen was very large, reaching to the navel, there were three points

very suggestive of pernicious anæmia—namely, the very low blood count, the extraordinary number of nucleated red blood-corpuscles, and the remarkable way in which the blood improved and the spleen reduced in size under the use of arsenic, iron, good food, and fresh air. While sometimes a little enlarged, the spleen in pernicious anæmia is more commonly small, and I do not remember ever to have seen it so large as in Case XIII. A relatively low hæmoglobin percentage is rare in this disease. Another case, in which there was a doubt, was a Mr. C., aged sixty-one years, admitted July 6, 1892. He had a profound anæmia (under 1,000,000 per c.mm.), and the spleen was three finger-breadths below the costal margin. He had at first a slight leucocytosis and a remarkable increase in the number of lymphocytes, without any special sign of lymphadenitis. Two weeks before his death the condition changed from one of anæmia to that of leukæmia, and in a count of 1000 leucocytes there were 841 lymphocytes.¹ This was probably an anomalous case of leukæmia. It was very thoroughly studied by Dr. Thayer and Dr. Barker, who will subsequently publish the case in detail.

(b) From certain cases of *splenic leukæmia*. There are cases of splenic leukæmia in which the leucocytes gradually diminish and remain at the normal number for protracted periods. In my text-book I give a chart of a case, in which, from February 6th to the end of April, the leukæmia had disappeared. For the greater part of the time there was leukopenia. The myelocytes, however, were still present, and from them a suggestive diagnosis, at least, might have been made. Bennet also refers to a case of this kind in his clinical lectures.

A very remarkable case came under observation in September, 1898. The patient at the time presented the features of a splenic anæmia, while a few months previously leukæmia had been diagnosed. As the case will be reported in full by Dr. McCrae, I shall give only the briefest abstract. Man, aged twenty-eight years, never very strong, but of good habits; no malaria or lues. He came complaining of weakness and of swelling of the abdomen. During the summer he had been under the care of Dr. Lichty, who had diagnosed a splenomyelogenous leukæmia. The hæmoglobin was 45 per cent., the reds about 50 per cent., and the leucocytes 1 to 4. He had improved very rapidly, and when he first came under our observation the leucocytes were only 9250 per c.mm. The spleen was greatly reduced in size, and there were no nucleated reds, no myelocytes. Fortunately, Dr. Lichty had kept slides, which he was kind enough to send us. The blood was that of an ordinary splenomyelogenous leukæmia. The patient was under observation again in April, 1899, and the leucocytes were only 5000 per c.mm.; hæmoglobin, 70 per cent.; red blood-corpuscles above 5,000,000.

¹ Such cases are exceedingly rare.

(c) From cases of *Hodgkin's disease with enlarged spleen*. There is no warrant for the opinion that these cases of anæmia splenica have anything to do with Hodgkin's disease (anæmia lymphatica) from which the clinical picture is very different. Slight enlargement of the spleen is common enough in Hodgkin's disease, but it rarely attains a large size, and I do not remember an instance in which it caused, *per se*, special symptoms.

In not one of the series of cases of which I have notes have the lymphatic glands been enlarged at any stage of the disease. So, also, in splenomyelogenous leukæmia there is rarely any great enlargement of the lymph-glands. In an interesting case, seen recently, the spleen and lymph-glands were enlarged without any anæmia or leukæmia.

William W., aged sixty-four years, referred to me by Dr. Wolfe, of Roanoke, November 13, 1899, complaining of pain in the side and swelling of the lymph-glands. He had not had syphilis; no malaria; was a very moderate drinker. He was a very healthy, robust-looking man for his age. There was general enlargement of all the external lymphatic glands; in the neck they were as large as hazel-nuts. The inguinal groups were uniformly enlarged, as big as cherries; the epitrochlears slightly enlarged. The spleen was three finger-breadths below the costal margin; the edge and the notch were easily felt. The edge of the liver could be felt below the costal margin. It was not specially firm nor painful. The inguinal glands above Poupart's ligament were enlarged. He had had no fever, no sweating. The red blood-corpuscles were 5,500,000, the leucocytes 10,000, hæmoglobin 87 per cent. The differential count by Dr. Thayer of the leucocytes showed a normal relation of the different forms.

(d) From *cirrhosis of the liver with enlarged spleen*. Banti has described cases with a triple combination of anæmia, enlarged spleen, and cirrhotic liver. Some of these cases he thinks represent the terminal stage of a splenic anæmia. From the history of recurring attacks of ascites, in Case IX. I thought it possible that the liver was cirrhotic, but the autopsy showed that it was normal. In Case XV., though the patient had been a temperate man, he had a reduced area of liver-dulness, and when we examined him in November, 1899, we might have laid some stress upon this had not the same condition been noted by Dr. Thayer four years previously, and it is not likely that he would have enjoyed continuous good health and to-day show no signs of trouble with a progressive cirrhosis of the liver. I have no personal knowledge of the interesting condition described by Banti.

There are three varieties of cirrhosis of the liver with which enormous enlargement of the spleen may be associated, and which may lead to doubt in diagnosis.

(a) *Alcoholic cirrhosis*. In long-standing cases the spleen may be

enormously enlarged, and if ascites be present, or there have been recurrent hemorrhages, the clinical picture is very like that of primary splenic anæmia. The history, the facies, the more moderate enlargement of the spleen, and the whole course of the disease should enable one to make a diagnosis.

(b) *Syphilitic cirrhosis.* Enormous enlargement of the spleen may be secondary to gummous hepatitis, and in children with congenital syphilis this may cause difficulty in diagnosis. The history, the irregularity of the liver, and the more moderate enlargement of the spleen would be the important point. Illustrating the association of anæmia with enlarged spleen in syphilitic liver, there was admitted to my ward in 1891 a girl, aged twenty-three years, with signs of hereditary syphilis. She had trouble in the abdomen eight years ago, since which time it had been enlarged. She had a chronic pleurisy on the right side. When admitted she had fever—temperature 103° . The abdomen was greatly enlarged, and the whole of the left side was occupied by a greatly enlarged spleen. The right epigastric and upper umbilical regions were occupied by a second firm, irregular mass. There was slight enlargement of the lymph-glands. The blood showed: red blood-corpuscles, 2,234,000 per c.mm.; leucocytes greatly increased; a ratio of 1 to 25 red blood-corpuscles; hæmoglobin, 28 per cent. She died four days after admission. There was found a greatly enlarged spleen, measuring 23 x 16 cm., and weighing 1510 grammes; a syphilitic liver, much divided by fibrous bands, and necrotic gummata throughout its substance. The mesenteric and peritoneal lymph-glands were slightly enlarged. This was the largest spleen I have ever seen in cirrhosis of the liver.

Another case was that of C. A. H., aged thirty-four years, admitted December 11, 1897, with anæmia and an enormously enlarged irregular spleen. He had been a very heavy drinker; had a well-marked history of syphilis. Jaundice when seventeen. Three years ago he had jaundice and dropsy, which gradually disappeared. Eighteen months ago he noticed the mass in the left side of the abdomen, and he has gradually been becoming anæmic. Blood on admission: Hæmoglobin, 28 per cent.; red blood-corpuscles, 1,400,000; leucocytes, 7500 per c.mm. The spleen was enormously enlarged and irregular, and the liver could also be felt as an extremely irregular mass in the right hypochondrium. He had several attacks of colic while in the hospital, and was jaundiced. He improved very much, the spleen diminished in size, and he left the hospital with the hæmoglobin at 65 per cent., red blood-corpuscles 3,000,000, leucocytes 8370. In this case the history of syphilis, the previous attack of jaundice, and the irregular condition of the liver left no question, I think, as to the presence of syphilitic hepatitis with secondary enlargement of the spleen.

(c) *Hypertrophic cirrhosis.* Hæmachromatosis, that remarkable condition of hypertrophic cirrhosis with melanoderma, enlarged spleen, and diabetes as a terminal phenomenon, may simulate anæmia splenica. The spleen may be very large, and in the later stages ascites and hemorrhages have been noted. Anæmia is not often present, and in two early cases which I have examined the blood count was normal. In young persons there is a non-alcoholic hypertrophic cirrhosis of the liver, with very great enlargement of the spleen, in which, when anæmia exists, it might be difficult to reach a diagnosis. In not one of the fifteen cases here recorded was the liver greatly enlarged.

Doubt has been expressed as to the existence of a separate and distinct disease to which the term splenic anæmia should be given. We do not know whether the anæmia is the result of the enlarged spleen, or whether, as seems more probable, both are secondary to some cause as yet unknown. Provisionally, until we have fuller knowledge, it is useful to group together, as I have done here, cases of idiopathic enlargement of the spleen with anæmia and without lymphatic involvement, and to label the condition splenic anæmia. There are borderland cases difficult to classify, but, on the whole, the composite picture, as obtained by grouping the fifteen cases here recorded, has tolerably definite outlines.

The treatment is that of the severe types of anæmia. Case XIII. illustrates how rapidly improvement may follow under iron, arsenic, sunshine, and good food. In the chronic cases with recurring hemorrhages the question of removal of the spleen should be considered. It was successfully carried out in Case IV., and the patient has remained well for more than a year.

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THE CHRONIC INTERMITTENT FEVER
OF ENDOCARDITIS.

THE CHRONIC INTERMITTENT FEVER OF ENDOCARDITIS.

BY WILLIAM OSLER, M.D., F.R.C.P. LOND.,

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the Johns Hopkins Hospital, Baltimore.*

THE type of endocarditis characterised by a protracted course and an irregular intermittent fever has been specially studied by Wilks, Bristowe, Coupland, and Lancereaux. In my *Gulstonian Lectures* (1885) its characters are thus described: The paroxysms may have the features of ague; the chill, hot stage, and sweating succeeding each other with regularity, and in the intervals there may be an entire absence of the fever. The quotidian type is the most common; the tertian has occasionally been described; and in rare instances two paroxysms have recurred within the twenty-four hours. The disease may be much prolonged, even to three or four months.

One of the first references I find to cases of this kind is in a footnote to one of Dr. Ormerod's *Gulstonian Lectures*,¹ in which a case of Dr. Bond, of Cambridge, is narrated—an instance of chronic valvular disease, with intermittent fever and diarrhœa, two paroxysms occurring in the day. The case lasted four months. In a remarkable case described by Dr. Wilks,² during a six or seven weeks' illness, rigors recurred with such regularity that a tertian ague was suspected for a time, although the patient was known to be the subject of heart disease. In some instances, the existence of ague previously has rendered the condition much more puzzling. In several of Lancereaux's cases³ the patients had had intermittent fever a short time

¹ *Medical Gazette*, 1851.

² *British Medical Journal*, 1868.

³ *Gazette de Médecine*, 1862; *Archives Générales*, 1873.

before; so also with one of Leyden's cases.¹ But the most extraordinary case of the kind is recorded by Dr. Bristowe.² A patient had ague in October, with chills once or twice a day, in an illness of six weeks. After an interval of two or three weeks they recurred in the second week in December, and continued until December 23. She was well for a few days, and then the attacks recurred after sleeping in a cold bed, and persisted until her admission to hospital on February 12. For the four weeks previous to entrance, the attacks came every twelve hours regularly. A murmur was noticed; but the history of ague was so clear, and the attacks so characteristic, that a suspicion of malignant endocarditis was at first not entertained. It was only after the failure of quinine, and a variation in the character of the paroxysms, that a diagnosis was reached. In this case, the most protracted with which I am acquainted, the condition persisted for more than five months, and Dr. Bristowe has informed me that he regarded the case as one of ulcerative endocarditis from the outset.

I have recently had under observation a remarkable case in which the symptoms persisted for nearly ten months; and through the kindness of Dr. Mullin of Hamilton, Ontario, I am able to give the notes of a second case in which the disease continued for eleven months. The clinical features of these two cases may thus be summarised:

(1) Daily intermittent pyrexia for many months, the temperature rising to $102^{\circ}\cdot5$ and 104° , occasionally preceded by a distinct rigor, more commonly by feelings of slight chilliness. Following the pyrexia there was more or less sweating.

(2) Progressive failure of strength, with varying intervals of improvement.

(3) Physical signs of cardiac disease—in the cases here reported an apex systolic murmur, with hypertrophy of the left heart.

(4) Development towards the close of the embolic symptoms more usually associated with ulcerative endocarditis, and cutaneous ecchymoses.

¹ *Zeitschrift f. klin. Med.*, vol. iv. Berlin.

² *British Medical Journal*, 1881.

The anatomical condition in both cases was the same, namely large vegetative outgrowths on the mitral valve.

Case I.—A. B., aged forty-three, merchant, admitted from Missouri to the private ward of the Johns Hopkins Hospital on March 13, 1892, complaining of weakness and fever. The patient has an excellent family and personal history, and up to the onset of the present trouble has enjoyed good health. Twenty years ago he had an attack of typhoid fever, with which he was confined to bed for six weeks; and when a young man there is an undefined history of an attack of what he says was "chronic malaria." There is no history of syphilis or of any excesses, except perhaps in tobacco.

His present illness began, early in December 1891, with a chill, accompanied by fever, general malaise, and muscular soreness; headache, loss of appetite, insomnia, and cough were marked symptoms, and also, according to Dr. Block, who kindly gave us these details, marked suffusion of countenance. The spleen was enlarged. The severity of the symptoms abated in a few days, and he improved so far as to attempt to continue his business. In about three weeks, however, there was marked dyspnœa with increasing cough, and it was noted for the first time that he had a loud systolic murmur at the apex. He had a daily fever of an intermittent type, usually sub-normal in the morning, and ranging from 102° to 103° in the evening, with occasional sweats. He complained of pains in different parts of the body, particularly in the left inguinal region, and there was tenderness over the fourth and fifth left costal cartilages near the sternum. Throughout the winter the intermittent fever persisted, and there were weakness, cough, and dyspnœa, so that he was confined to his bed for the greater part of the time.

The condition on admission was as follows: Patient is an under-sized man of fair musculature; not emaciated; slightly anæmic, and with a sallow complexion. The tongue is clean and red; the papillæ prominent. Pulse is 92, regular, of medium volume, the tension about normal. The radials are not stiffened. The temperature at the time of examination was normal. The thorax is well-formed; the costal angle good. Percussion gives everywhere a full and clear resonance, and on auscultation there are heard normal breezy breath-sounds.

Heart.—The impulse is feebly visible in sixth interspace, 3 cm. outside of nipple line. The impulse extends as far as the parasternal line; it is not forcible, nor heaving. On palpitation the shock of the second sound is well felt over the whole præcordial area. There is no thrill. The impulse at the point indicated above is visible, but scarcely palpable. It is most forcible in the parasternal line in the fifth interspace. The area of absolute dulness begins on the fourth rib in the parasternal line; does not extend beyond the nipple to the left, nor beyond the mid-sternal line to the right. Auscultation—In the apex region there is a loud systolic murmur of a somewhat musical quality, which is propagated to the axilla and is well heard at the angle of the scapula. It almost completely masks the first sound. Towards the sternum it diminishes in intensity, but is well heard at the ensiform cartilage, and is feebly heard as far as the right parasternal line. Along the left sternal margin it diminishes in intensity above the fourth rib, and is only just audible in the second left interspace. The second sound is very loud along the left sternal margin, particularly below the second interspace. The sounds at the aortic cartilage are clear, and there is no diastolic murmur. Both sounds are audible in the carotids; the second not accentuated. There is no distension in the veins of the neck; the aorta is not palpable in the sternal notch. There is no tracheal tugging. Examination of the abdominal organs is negative; the edge of the spleen cannot be felt; the dulness is almost entirely masked by colon and stomach tympany. The liver is not enlarged; there is no swelling of the lymphatic glands.

Urine.—Sp. gr. 1019, acid, no albumen. The blood count showed above four millions of red corpuscles to the cubic mm., and marked leucocytosis, the ratio being one white corpuscle to seventy-five red.

The patient was under our observation from March 15 to May 10, and his history during this time may be thus summarised. Fever: the temperature was taken every four hours. During his stay he had no chills, but he frequently had slight chilly feelings. The usual course of the temperature was as follows. The morning record varied from $97^{\circ}5$ to 98° . A rise took place through the morning hours and usually about 4 p.m.

the maximum was reached, from 102° to 103° ; then, throughout the evening hours, the temperature fell, and by midnight it was generally normal. Between four and five in the afternoon, sometimes not until the evening, there was sweating, occasionally profuse; more frequently the skin was only slightly moist. From April 14 to 24 the fever was lower than at any time during his stay in hospital, and for several days was below 100° . The pulse ranged from 80 to 100, was always regular, and of medium volume. The respirations were never increased. His general condition improved somewhat, and he gained slightly in weight. The appetite was fair, and he never had any special gastric trouble. His only complaint was of pain in the left side in the splenic region, and sometimes there was very distinct tenderness on pressure.

Repeated examinations showed no apparent change in the cardiac condition. The intense systolic murmur at the apex, obliterating the first sound, persisted. No increase could be determined in the area of cardiac dulness. The sounds in the aortic region remained clear. The patient left the hospital on May 10, and the history chart was headed "chronic vegetative endocarditis."

For the subsequent history I am indebted to Dr. Block, who has sent the careful temperature chart kept by the nurse up to the time of the patient's death. From this it may be gathered that the temperature range throughout May and June was from 97° to 103° . In July the average was decidedly lower, and towards the end of the month he had several days when the temperature was almost normal. Early in July petechiæ appeared, and several groups of these were noticed. On August 19 the temperature became normal, and remained so until the 24th; but the pulse was weak and he had free sweats. During the first week in September the temperature was usually sub-normal, and only reached 98° in the evening. The morning temperature was frequently 95° . There were profuse perspirations. From the 9th until his death on the 14th the temperature only once registered 98° , and for four days was continuously below 96° . He failed progressively, became extremely emaciated, had diarrhœa, and there were blood-corpuscles and blood-casts in the urine. The pulse was feeble, irregular, and intermittent.

There were no brain symptoms, and he remained conscious until the last.

Autopsy (by Dr. Block) made on September 16 at 9.15 a.m., twenty-one hours after death.

Body extremely emaciated; abdomen strongly retracted; rigor mortis very slight; petechiæ universally distributed over the skin and mucous membranes; corneæ clouded and pupils equally dilated; dependent portions of body œdematous.

Thorax.—Left pleural cavity contains about four ounces of serous fluid; no adhesions. The right pleural cavity presented adhesions in the upper lobe, of old date. Posteriorly hypostatic congestion of the left lung; right lung healthy throughout; petechial spots well marked on both pulmonary pleuræ.

Heart.—Pericardial sac contains a small amount of fluid, no evidences of pericarditis; heart firmly contracted; left auriculo-ventricular orifice easily admits one finger; the valves, chiefly on ventricular surface, especially of the posterior leaflet, being studded with an enormous mass of vegetations, some of which had undergone calcareous degeneration; the chordæ tendineæ thickened, and studded with similar projections; right auriculo-ventricular orifice easily admits two fingers; valves normal, pulmonary and aortic orifices and valve normal, and the vessels free of clot, seemingly healthy. A few petechiæ on the serous coverings of the great vessels. Heart muscle pale and firm. The heart *in toto*, though apparently small, corresponds with the weight of the body.

Abdominal cavity.—Spleen slightly enlarged and of about normal consistence; at its inferior extremity an abscess containing about three ounces of dirty sanious pus, with thickened wall; a large anæmic infarct just above it.

Liver.—In size corresponds to the body. Gall bladder full; no evidences of disease.

Kidneys.—Relatively increased in size, pale, capsule easily detached; there is an anæmic infarct in the medullary structure near the inferior portion of the left organ.

The *peritoneum* generally studded with petechial extravasations.

Stomach.—Empty, small, coated with mucus, walls thrown into longitudinal folds and somewhat thickened; mucosa of an

intense pinkish hue, and uniformly tinged with mucous and sub-mucous extravasations.

Intestine.—Jejunum, ileum, and colon marked by hæmorrhagic extravasations, not so intense, however, as in the stomach; no ulcers; the mesenteric glands not enlarged; all the intestines very much reduced in volume.

Brain not examined. No bacteriological examinations or cultures made.

Case II. (Report by Dr. Mullin).—Miss E. G., aged 28. Father died of aneurysm of the first part of the arch of the aorta, at fifty-four years of age; mother living and well, except that she has suffered with gall stones on several occasions. Three brothers and one sister are living; one brother has disease of the aortic valves with regurgitation. The patient has generally enjoyed good health, but at twelve years of age she had an attack of rheumatism, apparently not severe, as she was in her room only one week, and not in bed all of the time. About four years before the onset of her last illness she had pain and slight swelling in one knee, was not confined to bed, but wore a splint for a week. She has always been pale, and when at boarding school her teacher often suggested that iron would be of use. She, however, did not feel ill, and scarcely ever thought that she required medical treatment. At times, however, upon some sudden exertion she felt a stabbing pain in the region of the heart which never lasted long. The menses were always regular until the early part of the illness. In February 1888, she caught cold when tobogganing, and had pain in the back part of the chest, but did not require to go to bed. In March she visited some friends at Niagara Falls, where she remained until July. Here her friends noticed that she looked miserable for some time before she spoke of being ill. The menses failed to appear, and she thought this was the reason why she did not feel so well as usual. She sometimes had attacks of faintness, which soon passed away on taking a stimulant. She became weaker, and had fever followed by night sweats; the fever came on in the afternoon. A physician was consulted, who said the heart was affected and that she required prolonged medical treatment and rest. She continued, however, to go about, and

frequently took long walks, though on exertion she complained of being short of breath. She had fever and sweating at night, and was often so restless that she was obliged to leave her bed and recline on the sofa.

Before she came home her hair became very thin, and much of it fell out. It was cut short, and afterwards the colour was not so dark. Menses were absent only one month, until March 1887, when they ceased and did not return.

In the first week of July she came home, and was placed under my care. In the forenoon the temperature appeared normal, but every afternoon it rose to 102° or 103° . For a time she was thought to have typhoid fever, but no distinctive symptoms appeared. A milk diet was given, but when it became apparent that the fever was not typhoid, she took such forms of nutritious food as suited her taste.

The fever, especially from September, was attended with sweating, more or less profuse. It was often noticed that when sleeping in the afternoon her hair would become wet with perspiration. No local symptoms arose to account for the fever; pain was not complained of to any great extent; sometimes, for a few hours or half a day, there would be aching and pain in the hands and different joints, but these were always transient and at no time after she came home was there marked tenderness or swelling in any of the joints. When she reached home there was some swelling of the ankles and knees, but this soon passed away as she remained in bed. Not making any exertion she did not suffer from dyspnœa. There was a loud systolic murmur at the apex; and from the first the signs of hypertrophy showed that mitral disease had existed for some time. Before she came home it was noticed at the outset of the illness that small spots appeared on the hands and feet, also on arms and legs and face, that looked like "hives." These continued to appear; they were erythematous, some as small as a pea, others as large as a five-cent piece, with a white point in the centre. They often passed away in a few hours, and never lasted longer than the evening of the day on which they appeared. They were not numerous; sometimes they would appear near the tips of the fingers, which for a short time became swollen. These spots were seen more or less throughout

the illness, though more of them were noticed in the early part. She had frequently, at the time of the day when fever was more marked, sensations of chilliness, and several times in the winter at distant intervals there was a severe rigor; on one occasion her sister said that "the bed fairly shook." These were followed by high fever, and very profuse sweating. The appetite was variable, never very good, and often it was difficult to tempt her to take food. The bowels required the use of mild purgative medicine. Urine was examined frequently; sometimes there was a deposit of urates, but through the greater part of the illness the urine was normal; near the end albumen was found, and there was then œdema of the face and extremities. There was a slight cough late in the illness. At no time were there any indications of lung disease. The strength failed gradually. About two weeks before death, without apparent cause, a severe attack of diarrhœa occurred, lasting from 4 p.m. until the following morning, after which the decline of strength was more rapid. About three days before death the mind, which before had been clear and active, became clouded, and she died in coma.

A careful temperature record was kept in this case from July 17, 1888, until July 7, 1889. The type of fever was in each month remarkably uniform; the morning record always at or below the normal point, and the evening record reaching $102^{\circ}5$, 103° , and sometimes 104° . At intervals for a week or two the evening temperature did not fall below 100° .

The *autopsy* showed moderate enlargement of the heart, due chiefly to hypertrophy and dilatation of the left ventricle. The aortic valves were normal; the mitral orifice readily admitted two fingers: the valve segments were thickened and presented numerous large vegetations, chiefly on the auricular surfaces, and extending from the base of the posterior segment to the wall of the left auricle. The chordæ tendineæ were a little shortened and thickened, and many of them encrusted with the vegetations. The spleen and kidneys contained numerous infarcts in all stages of change.

The diagnosis of these protracted cases is often very difficult, and not unnaturally they are mistaken at the outset for malarial fever, particularly when daily chills occur. In other instances

as in Dr. Mullin's case, the disease is at first thought to be typhoid fever. In *Case I*, prior to the onset of his illness, the patient was not known to be the subject of valvular disease while in *Case II* it is very probable that the attack of rheumatism at the twelfth year laid the foundation for chronic mitral lesions.

In chronic valvular lesions, particularly of the aortic segments there may be persistent fever, rarely however of a typically intermittent type, and in a majority of instances the cardiac features of the case predominate. The special interest of the group illustrated by these cases is the chronic intermittent fever with progressive failure of health and strength, without dyspnœa, anasarca, or other features of valvular disease.

A CASE OF MULTIPLE GANGRENE IN MALARIAL
FEVER.

(WITH ILLUSTRATIONS.)

BY WILLIAM OSLER, M. D.,

Professor of Medicine, Johns Hopkins University.

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There are three groups of cases of multiple gangrene:

(1.) *Raynaud's disease*.—There have been previous well-marked vascular disturbances in the extremities (syncope, asphyxia or hyperæmia), the gangrene is very often symmetrical, is usually slight in extent and limited to the fingers or toes, more rarely to the ear-tips or nose.

(2.) *Multiple spontaneous gangrene of limbs*.—In young or middle-aged persons, without any obvious cause, massive gangrene of one, two or three extremities occurs. Many illustrations of this are recorded in the literature.

(3.) *Multiple spontaneous gangrene in association with the acute infections*.—In measles, typhoid fever, typhus fever, scarlet fever, diphtheria and malaria, local gangrene may occur. There are multiple patches, not symmetrical, and the skin and subjacent tissues are more frequently affected than the extremities. While of course the phenomena of Raynaud's disease may occur as a sequence of any of the specific fevers, a large proportion of all the cases of local gangrene occurring during or after one of the fevers have nothing whatever to do with this affection.

The relationship between malarial fever and Raynaud's disease is believed to be very close. Many references are given to cases (a majority from French sources) by Barlow in his article in Allbutt's System, and more fully by Monro in his excellent monograph on the disease. (Glasgow, *James Maclehose & Son*, 1899.) Altogether, in the cases he has collected, there were only 8.3 per cent. with malarious antecedents.

I have looked over the notes of cases of Raynaud's disease which I have seen in Baltimore, nine in number, and I do not find malaria to be related as an etiological factor in any one of them, nor, so far as I know, in our very large series of cases of malaria during the past ten years has there been a single instance of Raynaud's disease.

The following case is a very remarkable illustration of multiple gangrene occurring in a case of æstivo-autumnal malaria. Similar cases have been reported in the literature, and are referred to by Monro in his monograph (page 96), but they seem to be exceedingly rare.

CLINICAL SUMMARY.—*Malaria when six years old—typhoid fever twice—last attack four months before onset of present illness—illness in the middle of October, supposed to be influenza, but more probably malaria—on November 2nd, onset of spots of gangrene in various parts—rapid extension—condition on admission as shown in the figures—complexion muddy—spleen enlarged—blood showed very many æstivo-autumnal organisms—temperature slightly elevated at first—subsequently no fever—rapid recovery.*

P. W. B., aged 23, bar-tender, admitted to Ward E, Thursday, November 29, 1899, complaining of sores on various parts of his body.

Family history.—Mother died of consumption. No history of rheumatism or of any special disorders of the skin.

Personal history.—As a child he had measles, mumps and whooping cough. When six years old he had malaria. Five years ago he had a very severe attack of typhoid fever, after which he had an abscess in the abdominal wall, which opened spontaneously and discharged for two months, leaving a large scar. He had at the same time many boils. Last year he went south with the Fifth Regiment, and in August he had a second attack of typhoid fever, and was ill for two months. He has had gonorrhœa twice; has never had lues. He has used tobacco freely; whiskey and beer in moderation.

Present illness.—The patient has been living in Baltimore this autumn, and has been very well until the middle of October, when he was ill in bed for nearly two weeks with pains in the back and general weakness; no fever, no chills, no herpes. The doctor called it influenza. The patient got



FIG. 1.

To illustrate Dr. Osler's Case of Multiple Gangrene in Malarial Fever.



FIG. 2.



FIG. 2.



FIG. 3.



FIG. 3.

up and was about for a few days, when, on November 2nd, just twenty-seven days ago, he noticed blebs about half an inch in diameter on both hands, which were slightly swollen. The next day a mottled area appeared on the instep of the left foot. It had a bruised appearance. A similar one appeared on the buttocks and on the dorsum of the right foot. Other spots came in the situation to be subsequently mentioned.

The hands and feet became very much swollen. The blebs broke and discharged a dark fluid; the skin around the affected areas was very red. There was no itching. He had some pain at night. Ten days ago he had slight chilly feelings. There had been no redness, nor swelling, nor blueness of the fingers or toes, and there had been no numbness or tingling. The urine had been clear. Dr. Fletcher made the following note on the day after his admission.

“The patient is a large-framed, well-nourished man; complexion rather sallow. The skin of whole body is pigmented, markedly so about nipple and umbilicus, to slight extent about genitalia; no increase in either axilla. The lips and mucous membranes are of fairly good color; no pigmentation of mucous membranes. Over dorsum of left hand, just behind knuckles, there are four whitish scars, the result of healing vesicles. Over the ring, middle and little fingers there is a brownish-yellow discoloration of the skin which is gradually peeling off where the blebs are healing. On palmar surface of same fingers the skin is raised in large blebs. The skin has a brownish-yellow color, and over the ring finger is quite gangrenous, and there is involvement of the subcutaneous tissue. The thumb and index finger are not involved.

“*Right hand.*—The dorsum of hand is unaffected. On the dorsal surface of first and second inter-phalangeal joints of index, middle and ring fingers the skin is thickened, brownish in color, no vesicles. Over the hypothenar eminences on palm is a large area, measuring 5x6 cm., in which the skin is loosened from the subjacent tissue, markedly discolored, and at one point a serous fluid is exuding. The palmar surface of all four fingers shows a gangrenous condition of the skin with vesiculation and oozing of fluid, most extensive on ring finger, where the process invades the palm of the hand.

“*Right foot.*—Over dorsum of foot, below ankle, is an area,

5x3 cm., in which the skin is gangrenous and exceedingly black; slough still adherent to adjacent tissue; surrounding skin, slightly pigmented. Over the heel there is an area of brown, discolored, thickened skin, measuring 5x6 cm.; this area is sensitive to the touch.

“*Left foot.*—Below external malleolus is an area, 5x3 cm., of gangrenous and sloughing black skin.

“*Left buttock.*—Just over the spine at the junction of the dorsal and lumbar regions there is a patch of dry gangrenous skin $1\frac{1}{2}$ x2 cm. Over left gluteal region there is an irregular gangrenous patch, quite dry, measuring $4\frac{1}{2}$ x2 cm., slightly sensitive to pressure.

“*Occiput.*—Over the lower part of occiput, on each side, there are two areas in which the scalp has a gangrenous appearance, slight oozing of fluid causing matting of hair.”

Though the history did not suggest malaria, as in the routine examination of the abdomen the spleen was found to be considerably enlarged, the blood was at once examined, and very large numbers of æstivo-autumnal organisms were found. The crescents were in unusually large numbers. Cultures taken from the blood proved negative. There was no leucocytosis, and the differential count was practically normal. The eosinophiles were only 2 per cent. The patient was at once given quinine in full doses, and he began to improve rapidly. The larger sloughs were treated with linseed poultices made with bichloride solution. Crescents and ovoids persisted in the blood for some time, though by December 15th they were rapidly disappearing. On December 14th, the gangrenous patches on both hands had healed. On the feet the sloughs had separated, leaving deep ulcers, the sheaths of the tendons being exposed. The urine examinations were negative throughout. The patient had a slight rise of temperature (100°) at first; subsequently none at all. The figures from photographs, by Dr. Brownell, illustrate the condition on admission.

LATENT CANCER OF THE STOMACH.

BY WILLIAM OSLER, M.D., AND THOMAS McCRAE, M.B.,
of Johns Hopkins Hospital.

IN a study of 150 consecutive cases of carcinoma of the stomach in the medical department of the Johns Hopkins Hospital, we have been very much interested in a group in which the disease was unsuspected during life. As Welch remarks, it is rare to find cancer of the stomach in an apparently healthy man dying of accident. The latent cases are most frequently met in old persons, in whom the symptoms may be very slight, or absent, or they are mistaken for the ordinary dyspeptic complaints of the aged. Even after the most thorough examination it may not be possible to reach a diagnosis. In obscure cases, particularly with dyspepsia and emaciation, the possibility of latent carcinoma should be borne in mind.

There are three groups of cases of latent carcinoma of the stomach:

1. A very small one in general hospitals, a very large one in almshouses and asylums, comprising cases in which the symptoms are those of a gradual enfeeblement without any indication of local disease—as Oliver Wendell Holmes puts it, in the “One Hoss Shay,” “a general flavor of mild decay, but nothing local.”

2. Cases in which, with an absence of gastric symptoms, the lesions of associated disease seem sufficient to account for the condition. In this group were 4 of our cases. In 2 the diagnosis of nephritis was made; 1 had advanced pulmonary tuberculosis with pneumothorax, and the fourth showed profound anemia with multiple venous thrombi. The following is a summary of these cases:

CASE I.—*Diagnosis of nephritis, arteriosclerosis and pleurisy; no gastric symptoms.*

No. 22. A. G., Hospital Nos. 2454 and 3251, male, aged 61 years, first admitted January 22, 1891, complaining of short-

ness of breath. A history of dyspnea, for some years. He had frequent attacks at night, and any ordinary exertion was difficult. With this he has had frequent cough. He had little appetite and the bowels had been loose.

Examination: Dyspnea, cyanosis, and edema. The arteries were very sclerotic. There was fluid in the left pleural cavity; over 600 cc. were withdrawn. The heart's action was rapid, with gallop rhythm; on January 20, 900 cc. were withdrawn from the left pleura, and the following day a friction-rub was heard in the left axilla. There were albumin and tube casts in the urine. The dyspnea gradually lessened, and by February 16 his condition was much improved.

The patient remained in the hospital until April 29; on discharge he was still slightly cyanotic, but the dyspnea had gone. There was slightly impaired resonance on the left side of the chest. There was nothing noteworthy about the abdomen. During his stay there were no gastric symptoms and the general condition of the patient improved.

Second admission, May 19, 1891, three weeks later. He looked very ill, cyanosed, and with dyspnea and hiccough. The pulse was scarcely perceptible. On May 23, 260 cc. of fluid were withdrawn from the left pleural cavity. His condition remained much the same until death on June 5, 1891. There was no complaint of any gastric symptoms. The temperature was practically normal during both admissions. There was no loss of weight on the second admission, and the nephritis and arteriosclerosis seemed to account for the symptoms, and no stomach-symptoms were present to draw attention to that organ.

Autopsy showed carcinoma of the stomach and esophagus, there being an elevated tumor-mass 7 by 2 cm., which was half in the stomach. The center was ulcerated. There was chronic diffuse nephritis, arteriosclerosis, aortic and mitral insufficiency, and chronic pericarditis. There was pleural exudate with a fibrinous pleurisy over an infarction in the right lung. There were no metastases. Thrombi were present in both sides of the heart and in the pulmonary artery.

CASE II.—General edema; albumin and granular and hyaline tube casts in urine, rapid emaciation; vomiting at onset, but none during his stay in hospital; diagnosis of nephritis.

No. 73. T. C., Hospital No. 10,234, male, aged 61, admitted June 26, 1894, complaining of swelling of the legs. His family history was negative. He gave a history of an attack like the present 20 years ago, which lasted for 2 months. He then had both edema and dyspnea. In the last 5 years he had gradually lost over 40 pounds. His present illness began about 5 weeks before with persistent vomiting which lasted for one week. Swelling of the legs then appeared, and the vomiting stopped. He was able to keep at work until 4

days before admission. His appetite has been good, and the bowels regular. Examination showed marked emaciation and fairly general edema. There was slight dullness over the right base. The abdomen was distended, tympanitic in the elevated and dull in the dependent portions, but it was held so tensely that attempts at palpation were not satisfactory. The urine was of dark color. Specific gravity 1012, showed a faint trace of albumin and contained hyaline and granular casts. The temperature was slightly elevated. The edema increased and the patient died on July 4.

Autopsy showed a large scirrhus cancer involving nearly the whole of the stomach, and extending to the esophagus. The stomach was adherent to all surrounding structures. The growth extended through to the peritoneum at places. There were secondary growths in the glands and liver.

CASE III.—*Tuberculosis and pneumothorax, all the symptoms those of chronic consumption; no stomach symptoms.*

No. 71.—J. A., Hospital No. 10,050, male, aged 41 years, admitted June 7, 1894, complaining of pain in the chest and cough. His family history was tuberculous. He had been very healthy previously. His present illness dated back about six months, though for some time before he had been troubled with a cough. This became worse, he had sharp pain in the left chest and several attacks of hemoptysis. For five months he had diarrhea, with the passage of mucus and blood in the stools. He has not had any appetite. There has been much loss of flesh. There was no history of any stomach-symptoms.

Examination showed great emaciation. There was clubbing of the fingers. There were marked signs on both sides of the thorax, both on percussion and auscultation. Pneumothorax was present on the left side. The abdomen looked natural, was nowhere tender and was negative on palpation. The temperature was only slightly elevated. The patient rapidly sank and died on June 11.

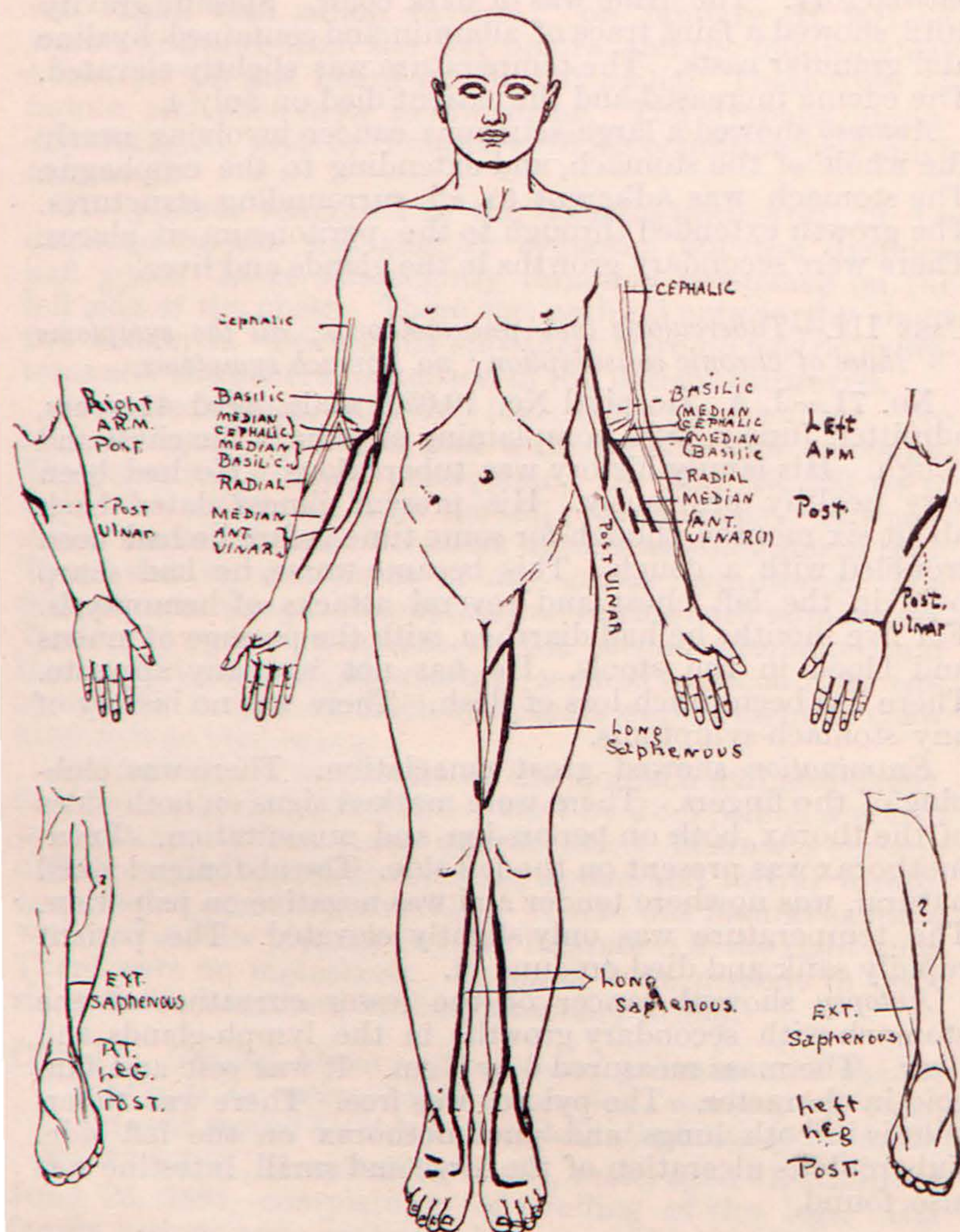
Autopsy showed cancer of the lesser curvature of the stomach with secondary growths in the lymph-glands and liver. The mass measured 6 by 5 cm. It was soft and fungoid in character. The pylorus was free. There was tuberculosis in both lungs and pneumothorax on the left side. Tuberculous ulceration of the large and small intestine was also found.

CASE IV.—*Multiple thrombi of superficial cutaneous veins; profound and progressive anemia; no gastric symptoms.*

No 64. G. N., Hospital No. 9131, male, aged 50, admitted January 31, 1894, complaining of weakness and pains in the arms and legs. His family and previous history were normal. The present illness, which began four weeks before, he attributed to exposure, wet and cold. He had a chill fol-

lowed by fever, which lasted some days. Pain then began in each leg and then in the arms. These were sharp, made worse by movement and there was a great tenderness of the muscles on pressure. There was not any edema, but great weakness. The appetite was poor. The bowels were regular.

Examination showed no marked general change, except



pallor and sallowness. The thorax was normal. On examination there was epigastric tenderness and marked resistance of the abdominal walls. Neither the spleen nor liver was enlarged. Many of the superficial veins of both the arms and legs were represented by firm hard cords. These thrombosed veins were somewhat sensitive. A portion of

one of these veins in the arm was removed. The thrombus was soft and could be squeezed out. Cultures made from it were negative. The chart shows the remarkable extent of the thrombosis:

Blood—Hemoglobin	39%.
Red corpuscles.....	2,300,000.
White corpuscles	6,000.

On February 10 edema appeared in the left leg. Very many of the superficial veins showed thrombosis. The left foot felt as warm as the right. On February 15 edema began in the right leg. The left femoral vein could be felt as a firm cord.

The anemia increased, the blood-count on February 16 being:

Hemoglobin	22%.
Red corpuscles... ..	1,716,000.
White corpuscles.....	29,000.

The differential count showed 89% of polymorphonuclears. No nucleated red corpuscles were seen.

The patient gradually sank and died on February 18, 1894. His temperature was constantly somewhat elevated. There were no stomach-symptoms.

Autopsy showed cancer of the pylorus with secondary involvement of lymph-glands, gastrohepatic, anterior mediastinal and subclavicular, and the liver. The mass occupied the lesser curvature and did not involve the whole pylorus, so that the orifice was not narrowed. There were also multiple venous thrombi.

This remarkable case excited very special interest, more particularly the unusual number of thrombi in the superficial veins, and their association with great tenderness in the muscles. Though we spoke of the possibility of malignant disease, yet there was no positive evidence obtained. He was not given a test-meal, as there were really no features whatever pointing to the stomach.

3. Cases in which the metastases completely mask the primary disease.

CASE V.—Paraesthesia in feet; symptoms of ataxia; gradual paraplegia; headache; marked pain in neck; development of a tumor in the right side of the pelvis; no stomach symptoms. Autopsy; primary carcinoma of lesser curvature of the stomach; secondary masses in the abdominal glands, the right ilium and the femur.

No 106. J. W., male, white. Hospital No. 14,944. Aged 40 years. Admitted January 10, 1896, complaining of inability to walk and pain in the neck and legs. His history

was negative and he had been healthy until his present attack.

Present illness began about 8 months before with peculiar sensations as of "pins and needles" in the feet. In about 2 months the weakness in the legs had so increased that he was unable to walk. Sensation was almost absent in the feet. Headache and pains in the neck had been severe. There had not been any special stomach symptoms, although he had vomited occasionally.

Examination showed emaciation and marked pallor. The abdomen was practically negative in the upper part. A mass was felt deeply in the right iliac fossa, which was palpable per rectum and involved the bony parts of the pelvis. There was great wasting of the legs with absence of the kneejerks. Blood-examination showed hemoglobin 48% ; red corpuscles, 2,432,000.

The patient had severe pain which required large amounts of morphin. The tumor of the right pelvis increased in size. He lost ground in every way. In February he developed marked mental symptoms with ideas of persecution, etc. Death followed on March 14, 1896.

Autopsy showed primary carcinoma of the lesser curvature of the stomach. The stomach was of normal size and on the anterior wall in the region of the lesser curvature was an area of new growth 6 cm. in diameter. There was no ulceration. Histologically, the growth was a colloid carcinoma. There were secondary growths in the abdominal glands and in the right ilium and femur. Unfortunately, the spinal cord was not examined.

CASE VI.—Pains in the right arm and right side of neck, with wasting of the muscles of the right arm ; inequality of the pupils ; development of nodular masses on the ribs ; diagnosis of cancer, but primary disease not suspected ; no gastric symptoms. Autopsy showed cancer of lesser curvature of the stomach ; a nodular mass compressing the brachial plexus ; metastases in tenth dorsal and first lumbar vertebrae.

No. 124. G. K., Hospital No. 17,993, male, aged 39 years, admitted December 1, 1896, complaining of pain through the right shoulder and back, with loss of sensation in the right forearm. His family-history was negative. He had had malaria every year for eight years past and pains in the shoulders and back, thought to be rheumatic. The most severe of these attacks was 18 months before, during which he spent two weeks in bed. Since then he has been very well and able to work. His occupation, an ironfitter, involved much heavy lifting. He never had any stomach or bowel trouble ; at times for many years he has had shortness of breath on exertion.

The present illness began in August, 1896, with coughing and profuse expectoration. Pain soon came on in the right

side, close to the shoulder, and was severe enough to make him give up work. The cough soon left him, but the pain remained. It gradually went down the right arm. It was constant and described as boring in character. It was worse on movement. About one week before admission he noticed a loss of sensation in the forearm, and at the same time he lost power in the right arm, so that since then he has not been able to use it. The pain and weakness has also extended to his back, so that he had difficulty in raising himself up in bed. The legs were not affected. There was no history of any injury. There had not been any stomach-symptoms. The bowels had been constipated. He had lost nearly 20 pounds in weight and much strength.

Examination showed fair nutrition. The patient remained usually on the left side, he seemed to suffer much pain and objected to changing his position or sitting up, on account of the pain it caused. There were prominences on the 4th, 5th, 7th, 8th, and 12th ribs, not attached to the skin, but to the bones. They were very tender, had a slightly elastic, but not fluctuated feeling. Examination of the thorax was negative. There was no dulness over the manubrium. The abdomen was flat, the muscles were held somewhat rigidly, so that palpation was difficult. There was marked wasting of the muscles of the right arm, and loss of power. There seemed to be some disturbance of sensation over the ulnar surface of the left arm, but the results were not constant. There was distinct inequality of the pupil, the left being larger. They both reacted to light and on convergence. Ophthalmoscopic examination was negative. The patient held himself very stiffly when asked to sit up, and the mobility of the head downward was much impaired. There was no pain on pressure over the spine. There was no general glandular enlargement.

Blood—Hemoglobin.....	92%.
Red corpuscles.....	5,752,000.
White corpuscles.....	13,000.

The patient had severe pain, and frequently required morphin hypodermically. He lost weight and strength. The masses on the ribs gradually increased in size, and became more tender. On December 26 it was noted that the abdomen was very tense, and moderately distended. No other abdominal symptoms were present. The leukocytes increased and were 22,000 on the 26th. A differential count showed 85% of polymorphonuclear. The patient generally sank, and died on December 30. During his stay he took nourishment fairly well. There was no complaint or sign of any gastric trouble.

The case was regarded as probably one of primary neoplasm in the thorax with secondary deposits on the

ribs and probably in the vertebrae. The absence of history of any gastric trouble and of any signs during his stay in the hospital, did not call for special attention to the stomach, and no test-breakfast was given. The abdominal examination was always negative, except that the muscles were held tensely. As the patient was difficult of examination this did not perhaps arouse the attention it should have done. The true condition was not suspected.

Autopsy showed cancer of the stomach. The lesser curvature was converted into a rigid mass over which the omentum was closely bound. The growth extended along the posterior wall. It did not involve the cardia or pylorus. On section all the coats were infiltrated. The mucous membrane was smooth, white, and opaque. Near the pylorus was an ulcerated area 3 by 3 cm. on the posterior wall. There were metastases in the lungs, bronchial, pericardial axillary and abdominal lymph-glands, ribs, skull, and vertebrae. There was compression of the bronchial plexus by a tumor-nodule. The vertebral metastases were in the first and tenth dorsal and first lumbar.

CASE VII.—Onset of illness with ascites; two months later aspiration of bloody fluid; recurrence of ascites with swelling of the legs; drainage of peritoneum; recognition of malignant disease of the stomach. Autopsy showed extensive cancer of the stomach.

No. 141. A. H., male, Hospital No. 21,173, aged 59 years; admitted November 9, 1897, complaining of "dropsy." His family history was negative. He had been a moderate drinker and denied syphilis.

Present illness began four months previously with swelling of the abdomen. This increased gradually and at the end of two months he was tapped by his physician, who drew off a large amount of bloody fluid. Soon after the abdomen began to enlarge again and this continued until the present admission. With this swelling of the legs came on. There had been some pain in the lower abdomen. His appetite had varied. He had occasional vomiting of mucus but no blood. The bowels had been irregular. There had been great frequency of micturition.

Examination showed emaciation but not cachexia. The thorax was negative. The abdomen was distended symmetrically. Movable dulness and fluctuation were obtained. The liver-dulness began at the fifth rib in the right nipple line and only extended a distance of 4 cm. Its edge could not be felt. There was edema of the legs, genitalia and lower trunk.

The case was suggestive in some ways of cirrhosis of the liver, although the history of bloody fluid being obtained on previous tapping pointed to malignant growth. The absence of any stomach-symptoms seemed against a primary growth there. The patient required tapping and it was thought best to do this by an exploratory exploration.

Operation.—On the abdominal cavity being opened a bloody turbid fluid was obtained. A mass was found in the stomach and secondary deposits over the peritoneum. The fluid showed numerous red corpuscles and leukocytes. There were also large cells many times the size of a leukocyte, some of which contained more than one nucleus. No signs of karyokinesis were seen. Certain groups of cells were found which were very suggestive of masses of cancer-cells. After the operation a firm mass was to be felt in the left hypochondrium. In the right hypochondrium several nodules were felt. The patient was much easier after the operation, but died suddenly on December 5, 1897.

Autopsy showed colloid carcinoma of the stomach along the lesser curvature from the cardia to the pylorus. The pylorus was converted into a dense ring and the growth extended for a short distance into the duodenum. The esophagus was invaded but the cardiac orifice was not narrowed. The omentum and peritoneum were involved. The stomach was adherent to the liver, spleen and diaphragm. The growth extended through the diaphragm to the pleura.

In reviewing this interesting series of cases, and particularly in the study of the autopsy records, one is astonished to notice how extensive and widespread the disease may be with practically no symptoms. In three of the cases a very large part of the stomach was involved, in two the cardiac orifice, and in two the pylorus. In one instance the growth involved the esophagus, and in one to a slight extent the duodenum. In three instances there was ulceration, and in five metastases were present.

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ON THE STUDY OF TUBERCULOSIS.*

By WILLIAM OSLER, M.D.,
of Baltimore, Md.

THE history of the acceptance of any great truth in medicine is an interesting study. A slow, gradual recognition seems essential to permanency and stability. As Locke well said, "Truth scarce ever yet carried it by vote anywhere at its first appearance." Even in this electric age the practical application of new knowledge is singularly tardy. Antiseptic surgery took twenty years to win its victory, and for about the same period we physicians have been participants in another long warfare, the successful outcome of which may be said to be now in sight. The twentieth anniversary of the discovery of the germ of tuberculosis by Robert Koch is near at hand—a discovery which, in far-reaching results, will prove to have had few equals in human history. Since 1881 the laboratory phase of the question, with its experiments and researches, has so far been the most complete; the clinical side has been enriched with two facts of supreme importance; first, the earlier and more positive diagnosis of the disease; and, second, a fuller knowledge of the means for its cure; and we have now entered upon an economic stage, and the tuberculosis leagues and congresses, laws and enactments, show how alive we have become to the importance of the disease in national and civic life.

I. *General Relations of Tuberculosis.*—If we compare the mortality bills of any large city today with those of fifty years ago, the most striking change is in a reduction of the deaths from fever, and in the absence of the names of certain diseases which were formerly amongst the most fatal of their kind. Public hygiene has done a great work in ridding us of several of the great scourges,

* Introductory Remarks at the organization of a Society for the Study of Tuberculosis, Johns Hopkins Hospital, October 30, 1900.

and in lessening the danger from such epidemics as cholera and yellow fever. Of the 10,152 persons who died last year in this city, 3,765 were victims of the infectious diseases. Measles, scarlet fever, diphtheria, whooping-cough, influenza and dysentery together accounted for 801. Three diseases head the list, each one as fatal as all the others combined; tuberculosis of the lungs 974, pneumonia 778, and cholera infantum 703. If we add the deaths due to tuberculosis of other organs, we are well within the mark in saying that one-tenth of the deaths in this city are due to this disease. It is estimated that above a million of persons are suffering with consumption alone in this country, of whom at least 150,000 die annually. The white plague, as Holmes called it, is the great scourge of the race, killing more than 5,000,000 yearly. Let me read you an abstract from De Quincy, which, while expressing an old, erroneous idea, gives in his strong and characteristic language the terrible, the appalling nature of this annual slaughter. "Are you aware, reader, what it is that constitutes the scourge (physically speaking) of Great Britain and Ireland? All readers, who direct any part of their attention to medical subjects, must know that it is pulmonary consumption. If you walk through a forest at certain seasons, you will see what is called a *blaze* of white paint upon a certain *élite* of the trees marked out by the forester as ripe for the axe. Such a blaze, if the shadowy world could reveal its futurities, would be seen everywhere distributing its secret badges of cognizance amongst our youthful men and women. Of those that, in the expression of Pericles, constitute the vernal section of our population, what a multitudinous crowd would be seen to wear upon their foreheads the same sad ghastly blaze, or some equivalent symbol of dedication to an early grave. How appalling in its amount is this annual slaughter amongst those that should by birthright be specially the children of hope, and levied impartially from *every* rank of society! Is the income-tax or the poor-rate, faithful as each is to its regulating tide-tables, paid by *any* class with as much punctuality as this premature *florilegium*, this gathering and rendering up of blighted blossoms by *all* classes? Then comes the startling question

—that pierces the breaking hearts of so many thousand afflicted relatives—Is there no remedy? Is there no palliation of the evil?" Let us be thankful that we can answer today—There is!

II. *Some Special Features of Tuberculosis as a Subject of Study.*—In a comprehensive view of the diseases which we are called upon to study, three only are of wide and universal interest—tuberculosis, cancer, and syphilis. In almost every particular tuberculosis out-tops the others. It is a disease of extensive distribution among animals, in which the veterinarian is interested equally with us. The general surgeon must know it thoroughly, and it occupies his thoughts almost as much as cancer, and his hands more than syphilis. The specialist must be familiar with its manifestations. Though not a disease upon which the specialist thrives, the laryngologist, the neurologist, the gynecologist, and the dermatologist see cases almost daily. Syphilis has a more enduring grasp, and, not content to follow man from the cradle to the grave, nips the fruit in the bud, and more often brands and maims than kills. Tuberculosis and cancer respect the embryo, and are not factors in intrauterine pathology. In many ways syphilis is the most benign of the three. There is a silver lining on the luetic cloud, which we never see in cancer, and not often enough in tuberculosis. And yet tuberculosis, which is a more serious disease than the others combined, offers a greater hope of a reduction in its ravages. We know the cause, the conditions under which the germs thrive and the modes of infection, and the public is at last awake to the importance of the subject, as shown by the remarkable manifestation of national and civic interest during the past few years. We have reached agreement on two points; first, the right of the State to insist that a tuberculous patient shall not be a source of danger to others, (and to this end there must be some supervision, to the extent at least of notification of the cases); and, secondly, the duty of the State, of civic authorities, or of private benefaction to provide suitable accommodation for the poor consumptives. The danger is not from the few well-to-do patients, in whose environments there may be less risk of infection than elsewhere. A person would probably run less risk of

“catching” consumption in the Adirondacks’ sanatorium than living in the tenement districts of New York, or in the Jewish quarter of this city.

III. *The Physician as a Student of Tuberculosis.*—The brunt of the battle in the warfare against tuberculosis falls on the medical profession. We must not only be alive to our duties, but thoroughly prepared to carry them out. If a man looks back on the best work of his life he will find it to be that for which perhaps he has had the least acknowledgment from the public or his colleagues in either cash or credit; and so it must ever be with the work of the units of our army, and particularly in their crusade against tuberculosis. Within the past ten years there has been an extraordinary change in the attitude of the average doctor to the question of consumption; he is more expert in the early recognition of the disease; he appreciates the conditions under which cure may be expected, and he is more ready to take every advantage of the opportunities offered by the health boards and their laboratories; but I must confess he still very often lacks the enthusiasm which is necessary to make a strong fighter. I know how hard it is in general practice, particularly among the poor, to carry out instructions which we rattle off so glibly or write down with so much self-satisfaction, but physicians cannot escape from their responsibility in this matter. To them the public must turn for help, since they alone can insist that the tuberculous patients shall live a hygienic life, and when all fully realize their duties we may look for a marked reduction in the incidence of the disease. The really serious peril is the prevalence of the disease among the poorer classes, who live in the smaller houses and tenements, who for the most part have no physicians to advise and instruct them, and who seek aid at the hospitals and dispensaries. Two years ago I was much impressed with the number of such cases applying at our out-patient department of the Johns Hopkins Hospital, and some kind friends placed at my disposal a sum of money which was to be used to promote the study of tuberculosis, and to diffuse among the poor a proper knowledge of how to guard against the dangers of the disease. A plan of systematic visiting of each applicant was organ-

ized, and Miss Dutcher will speak of her experience during the past year. It was felt that if a well-informed and sympathetic person paid a visit to the house, saw the conditions under which the patient lived, directions could be given with much more likelihood that they would be carried out. Valuable information could also be obtained as to the mode of life and surroundings of these people.

This Society has been organized to promote the study of tuberculosis among the physicians and surgeons of the Hospital, the senior students of the Medical School, and any physicians who may wish to attend our meetings. Believing in the inspiration of great names, we have called it after the name of the greatest student of the disease. An historical review of the great epochs, a minor item relating to the symptomatology of the disease, a critical summary of the conditions relating to tuberculosis in the country at large and in this city, together with a presentation from each of the departments of the work upon tuberculosis in the Hospital during the first decade, will constitute our program for the session.

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**FATAL ANGINA PECTORIS,
WITHOUT LESIONS OF THE
CORONARY ARTERIES IN
A YOUNG MAN.**

BY

T. E. BULLARD, M.D.,

OF SCHUYLERVILLE, N. Y.;

AND

WILLIAM OSLER, M.D.,

OF BALTIMORE.

FROM

THE MEDICAL NEWS,

DECEMBER 22, 1900.

*FATAL ANGINA PECTORIS, WITHOUT LESIONS
OF THE CORONARY ARTERIES IN A
YOUNG MAN.*

By T. E. BULLARD, M.D.,
OF SCHUYLERVILLE, N. Y.;

WITH DESCRIPTION OF THE HEART, AND REMARKS UPON THE CASE,
By WILLIAM OSLER, M.D.,
OF BALTIMORE.

J. J. H. was twenty-six years old, 5 ft. 10 in. in height, weighed 186 lbs., very strong and active, and was, to all appearances, in robust health just previous to his death. I had known him for fifteen years. His father is a printer and has occasional attacks of epilepsy. His mother is in fair health; his four sisters are all well but one, who has heart-disease.

As a young man, the patient was somewhat eccentric. In about the year 1892 he enlisted. While in the army he engaged a good deal in ball-playing, football and athletics generally. He had been a very heavy smoker. He had not had syphilis.

In the spring of 1895 he was discharged and about this time married. Shortly afterward he returned to his home. Talking with me one day, he told me that he had had an attack of heart trouble while in the army. He did not say that he had had more than one, or that it was serious. He remained in town a short time, when he left. I heard of him working as a telephone lineman and as fireman on a steamboat. After a few months he reenlisted and was sent to Ft. Keogh, Montana. In the spring of 1896 he was discharged for disability and came home.

He told me that while in the West he had been well for a few months, had marched some hundreds of miles, but that in the winter he was taken with severe attacks of heart trouble. The name of his disease he did not remember. He was in the hospital several months. He described his attacks as coming on at first every other night, then four or five times a week; said there was a most intense pain in the heart, and awful cramps in his arms, that he was given large doses of morphine, digitalis and nitroglycerin. He said that his attacks increased in frequency and in severity, and at one time after he had had an attack he was considered dead, that they were about to remove him to the dead-room when he showed signs of life. All attempts to cure him were despaired of and he was discharged.

A few nights after I had learned from him the story of his winter's sickness, I was sent for to come to his home. I found him in bed, suffering with an intense paroxysm of pain in the cardiac region. His muscles were cramped and he had stopped breathing. He thrashed around in bed for a few moments, and then there seemed to be a cessation of the pain and a relaxation of the spasm. He breathed rapidly, had a few minutes respite, and then the paroxysm of pain and the spasm of the muscles returned. The chest became fixed and for the time being it was impossible for him to breathe or do anything but thrash about in his agony, apparently trying to jar something loose in his chest or heart.

His pulse during the interval was about 130. Just before the paroxysm it decreased in force and frequency to about 100. Sometimes there seemed to be a distinct increase in the force and tension with the decrease in frequency. During the paroxysm the pulse was very faint and slow,

and as soon as it was past the pulse immediately acquired a rate of about 130 again. I gave him morphine, digitalis and nitroglycerin. The attack passed off in a few hours.

Seven days later I saw him in another attack similar to the first. This was May 19, 1896. After that he did not have another attack until July 7, 1896, when he had one similar to that which I have described. This was repeated on the 9th, 14th, 17th, 22d, 25th and 31st of this month and also on August 4th, 6th, 9th and 12th. These continued at decreasing intervals and with increasing severity until the next spring when the intervals increased and the severity of the attacks decreased. During the attacks there was no wheezing in the tubes. Exertion did not seem to cause them.

His attacks were more sure to come on and be severe after a cold, damp day. They most frequently came at from 7:00 to 10:00 P. M. I never knew him to have but one severe attack during the day, and on that day he had been walking in the hot sun, and was somewhat excited over a fireman's tournament which he was attending, but this attack was a very severe one.

I have notes of 105 attacks during which I was with him. At times the attacks were of the utmost severity. The pain was so intense that he would lose all consciousness. The muscular spasm extended to nearly all of the muscles of his chest and upper extremities, occasionally to his abdomen and legs, although it was always most severe in the left arm, neck on left side, chest and right arm, named in order of intensity. Some of the attacks lasted as long as five or six hours. There was always a similarity in the attacks, yet they were not exactly the same. To-

ward spring the pulse rate in the intermission was not as rapid and was slower just before and during the paroxysm. Time after time his respirations ceased for so long a time and his pulse became so feeble that he seemed to be dead. At times every muscles was in such a spasm that he could be picked up without his bending in the least. Sometimes to pick him up a few feet above the bed and drop him was the easiest way to reestablish respiration, and it seemed that had it not been for the most active efforts, rubbing of the muscles and artificial respiration, he would never have breathed again. This working over him had to be kept up for hours.

In order to relieve his attacks I at first depended principally on morphine. The doses had to be rapidly increased until 8 to 12 grains were given in order to have any effect on the patient. Digitalis, nitroglycerin and nitrate of amyl were used as indicated. The latter never seemed to be of much benefit. When owing to the repeated use of morphine, it seemed to have but little effect, ether was tried. I used to give him four or five grains of morphine and then etherize him. As a rule, after he was nicely under the anesthetic, the spasm would stop, the pulse would remain even, and if the anesthetic was continued for perhaps 30 minutes he would sleep on several hours and have no more pain that night and very seldom the next night. When it became so that it was almost impossible to etherize him I tried chloroform. This seemed to work equally well for a short time. Later, not being pleased with its effect, I discontinued its use. I finally depended almost entirely upon large doses of morphine. In the spring, after he ceased to have his attacks, he showed no evidence of having contracted the morphine habit. After the attacks had apparent-

ly ceased he went to New York, had an attack in a saloon, was taken to the hospital, where, according to the papers, the doctors did not know what to make of him. He went to Germany, came back again, worked on a dairy-farm near Boston, doing hard work, then came back to this place again, and remained for a few weeks, when he again left.

This was in the fall of 1897. I lost track of him for some time, but when I did hear from him I learned that he had gone to Europe with a circus. Whether he had any attacks during that winter, I do not know.

In the summer of 1898 he returned to this place and found employment as a teamster, at which occupation he worked until the middle of winter. During the winter he had a few attacks, but they were not as severe as usual. In the early spring of 1899 he left town again and worked in a paper-mill in New Jersey until the fall of 1899, when he again returned to this place. He had two or three attacks at intervals of a week or more in which I saw him. They were not of the most severe type.

November 27, 1899, he came to my office about 11:30 P. M. and told me that his pain was unusually severe. I immediately gave him several grains of morphine and noted his condition carefully. I saw that it was serious. His pulse in the interval was about 120 to 130. Just before a paroxysm it would slow down during the space of thirty seconds to about 90 and became very faint, then the spasm of the chest muscles suddenly came on. The spasm lasted from one to two minutes during which time he did not breathe. Then the breathing began again, the respirations would be rapid, and his pulse immediately ran up to 120 or 130. After having given 5 grains of

morphine, which was two grains more than I had given at any time this fall, and, failing to relieve him, I gave him a little chloroform. I wet the mask only once and held it to his face a few seconds. At this time the muscles of the chest became fixed and remained so, the breathing being entirely diaphragmatic.

It was 12:55 A. M. when I gave him the chloroform. At 1:00 A. M. his pulse was 68; at 1.05 it was 72. At this time I gave him some nitrate of amyl, hoping to help respiration. It did not seem to help him, and the respirations grew more rapid and short until they ceased entirely.

A short, sharp pressure over the ribs, together with artificial respiration, reestablished breathing, which continued for some time. At 1:25 A. M. his pulse was 127; at 1:35 A. M. it was 90. I gave brandy hypodermically freely. Strychnine, nitroglycerin and digitalis were also used in medicinal doses. Hot applications and rubbing were employed to assist in restoring the circulation.

He remained unconscious and the spasm of the chest which had been constant for some hours, relaxed. The attack now continued with intermissions and paroxysms. The pulse during the intermission was about 90. Just before and during the paroxysm it decreased to 60 or less. The interval between the paroxysms grew shorter, the respiration more shallow. The pulse became slower both before and during the paroxysm; during the height of the paroxysm it was at times about 30, and then for 15 seconds could scarcely be felt. At about 6:00 A. M. the paroxysms ceased. His breathing was short, shallow, rapid and regular. The pulse increased to about 120. It was weak and he remained unconscious. The respirations

became more shallow, the pulse more feeble, and he died at 6:40 A. M.

At the autopsy we found numerous adhesions between the left pulmonary and costal pleuræ. The heart weighed when removed 14 ounces and 2 drams. It was apparently displaced somewhat to the right, although the displacement may have been post-mortem. The heart was immediately sent to Dr. Osler for examination, who sent the following report and remarks bearing on the general condition.

The heart was of average size for a man of 186 pounds. Considerable amount of subpericardial fat. No pericarditis. The pericardium was everywhere smooth and glistening. The muscle of the left ventricle looked beefy and red; the wall measured in thickness 15 to 20 mm. The papillary muscles were not sclerotic. The mitral segments were thin and showed no marked abnormalities.

Right ventricle, muscle looked red and natural. The tricuspid valves were normal. The pulmonary artery measured exactly 7 cm. across the top of the valves. There was no sclerosis and the valves looked normal. The aorta measured not 6 cm. just above the ring, a small vessel for a man of five feet and ten inches, weighing 186 pounds. The arch only admitted the index finger to the middle of the second joint. The anterior coronary artery was not sclerotic in its course. There were a few flakes of atheroma along its course. Its orifice was large, unusually so, nearly 4 mm. in diameter. There was no atheroma in its immediate vicinity. Posterior coronary artery was not so large; quite free in its course. There was a small, supplementary coronary artery. No atheroma in the neighborhood; no atheroma in its course. No thrombi or emboli in either vessel.

There were a few scattered flakes of atheroma in the aorta. The aortic valves were a little thickened about the corpora Arantii and about their attachments.

On slicing the heart muscle it was red and natural looking; no infarcts; no sclerosis of its muscular fibers nor of the walls of the blood-vessels.

In men under thirty years of age angina pectoris is a very rare disease. There are cases with syphilis in which an acute aortitis is associated with severe and even fatal angina. More common are the cases of a neurotic type in high-strung, nervous persons who have been heavy smokers and given to excesses of all kinds. I have notes of four or five of this sort in young men and have described them in my monograph on angina pectoris (pp. 94-95). In Dr. Bullard's case the extent of the muscular spasm was unusual, although it is not unknown in the ordinary form of the disease. The association of epileptic seizures with angina has been described in the monograph (p. 64). The intensity of the attacks, their long duration, the fatal termination, and the negative condition of the heart and arteries make the case one of unusual interest.

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ON THE ADVANTAGES OF
A TRACE OF ALBUMIN
AND A FEW TUBE CASTS IN
THE URINE OF CERTAIN
MEN ABOVE FIFTY YEARS
OF AGE.

BY

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ON THE ADVANTAGES
OF A
TRACE OF ALBUMIN AND A FEW
TUBE CASTS IN THE URINE OF CERTAIN
MEN ABOVE FIFTY YEARS OF AGE.

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Year by year I see an increasing number of cases which justify the somewhat paradoxical heading of this brief paper. I do not wish to minimize the importance of the information to be obtained by an examination of the urine, but we must ever bear in mind the adage—true to-day as well as in the times of the old “Pisse-Prophets;” *urina est meretrix, vel mendax*—the urine is a harlot or a liar.

What I wish to emphasize is the importance of basing a judgment less on the urine than on the general condition of the patient. The cases to which I refer are well known to every examiner for life insurance. The successful business or professional man, who lives intensely and strives hard to get wealth or reputation, or both, and who takes plenty of good food three times a day, with two or three

glasses of spirits, and smokes six or ten cigars, works in blissful ignorance that his bodily mechanism is constructed on much the same principles as a steam engine. In the one, as in the other, fuel, combustion, transformation of energy, and the accumulation of waste materials tell the story of the day's work. The engineer as a rule understands his machine better, and accommodates the amount of coal burnt to the size of the engine and to the amount of work required. He does not "stoke" *No. 15*, a small yard engine employed to shunt empty cars, as he would *No. 580*, the superb machine drawing a limited express. Another important difference is the automatic action of the human engine in getting rid of its ashes and clinkers. The waste-pipes bear the strain of the extra work when the amount of fuel consumed and energy liberated is out of all proportion to the work demanded. *No. 15* "stoked" as if it were *No. 580*, drawing the lightning limited, would go to pieces very rapidly. So it is with our business friend, Mr. Silas Lapham. Careless stoking with high pressure for twenty-five years and bad treatment of his machine mean early degenerations, and his waste-pipes—kidneys—are often the first to show signs of ill usage. Such a man receives a very rude shock when in a polite note the head office of the New York Mutual or Equitable Company declines the extra fifty thousand dollars which he had wished to place upon his life, as the medical examiner reports "a slight trace of albumin and a few tube casts" in the urine. After a period of great distress and worry Mr. Lapham begins to take heart, and on the advice of his family physician remodels his mode

of life. He restricts his appetite, takes a light lunch and a moderate dinner, gives up whiskey and champagne, resigns from six or eight boards, and at fifty starts to live a rational life. Prospectively nothing could have been more advantageous than the discovery in the urine of a trace of albumin and a few tube casts.

Let me give a few illustrations. Throughout the winter of 1880-'81 I repeatedly examined for Dr. R. P. Howard the urine of a very distinguished man in public life in Canada, in whose urine albumin and tube casts had been accidentally discovered, on the occasion of his applying for additional life insurance. At this date the patient was a man of nearly sixty, who had lived a very active life, and who had been very careless in his habits of eating and drinking. I remember well the great anxiety of the patient himself and the distress that was felt at the possibility that the career of so useful a man would be cut short. In the summer of 1881 I went to England on the same steamer with him, and in London I discussed his condition with Sir Andrew Clarke, who took a very sombre view of the case. After a year or more of rest, the patient gradually got over his fright and began to resume work, of which he has in the past twenty years done perhaps quite as much as he did in the previous twenty years. He is still alive—an octogenarian of exceptional vigor.

Many of the most notable cases are those in which the patients have been rejected for life insurance. In the cathedral at Antwerp this summer I was touched on the shoulder and a voice in my ear whispered, "Not dead yet!" On turning I saw a gentle-

man who came to me on the 30th of January, 1891, at the age of fifty-three, in a condition of great trepidation, having been rejected a few days before for Bright's disease. He had been a hard worker and a high liver, and had a marked gouty history. In the ten years I have seen him once or twice professionally, and he has tried on several occasions to get additional insurance, but the urine, he tells me, though sometimes free from albumin, has, on centrifugalizing, a few tube casts. He is to-day a vigorous man of sixty-three.

Another interesting patient belonging to the same group of "the rejected of the life insurance companies," was a prominent politician, aged sixty, whom I saw on April 23, 1893, also much distressed in mind after the discovery of albumin and tube casts in the urine. He had been a very hard worker and a pretty steady drinker to his forty-fifth year, but since that date he has been very temperate. The patient had regarded himself as a very healthy man, and was much shocked to find his application for additional insurance refused. I have seen him at intervals, and while he has retired from active work, he is to-day a very healthy man of sixty-eight.

What I wish to call special attention to is the fact that in men in the fifth and sixth decades albuminuria is by no means infrequent and not always serious. It is probably the expression of presenile changes in the kidneys, the result of arterial degeneration, and is often a renal inadequacy, to use Clarke's term, not of vital importance. Neither the presence of albumin nor the number and variety of the casts

have the same value in estimating the character of the disease and the prognosis as other factors.

The points on which one should lay special stress as indicative of serious disease are:

1. Persistent low specific gravity of the urine, 1.008 to 1.012.

2. The state of the heart and arteries. Marked sclerosis of the peripheral arteries, with the apex beat of the heart an inch or two outside the nipple line, and a ringing, highly accentuated aortic second sound.

3. The presence of albuminuric retinitis.

It is not always easy to reach a decision, as there are cases in which the detection of a trace of albumin and a few tube casts first calls attention to the existence of serious organic disease. Two conditions have to be carefully differentiated. First, a primary arteriosclerosis, manifest sometimes as early as the fourth decade, and quite common in this country in men who live at very high tension, and who eat and drink a great deal. It is surprising how often this state is overlooked by the general practitioner. The renal changes are secondary, and are expressed by a transitory albuminuria, a not very low specific gravity of the urine, which is not in very large amount. The kidneys post mortem are often of full size, red and beefy in color, with a patchy, cortical sclerosis.

Secondly, the granular, contracted kidneys. Here the ætiological factors are all-important. The cases, which are less common than the arteriosclerotic variety, are met with in young persons consecutive to scarlet fever and other infectious disorders, in

middle-aged individuals who have had gout, in workers in lead ; while in others, in whom no definite factors can be determined, it would seem as if the kidneys had become prematurely aged and hard and fibroid. The cardiovascular changes are very much the same as in the arteriosclerotic group, uræmic symptoms are much more frequent, persistent headache is a notable feature, and retinal changes are very much more common.

Very few of us are made as was the Deacon's masterpiece, the wonderful One Hoss Shay, and lurking somewhere there is a weakest spot, very often in our modern mode of life the kidneys, which, to use the language of the Autocrat's fine poem, may begin to show "a general flavor of mild decay" in the fourth or fifth decade. In very many cases the albumin and the few hyaline casts are simply the expression of this "mild decay" in the kidneys, and not of a condition serious enough to be called Bright's disease. A very important factor, I am sure, is the excessive amount of food eaten. I am much impressed by Aphorism 13 of George Cheyne's *Essay on Regimen*, so well known to our grandfathers ; it is worth quoting, as containing the one important element, I think, in the treatment of the condition of which I am speaking : "Every *wise* man, after *fifty*, ought to begin to lessen at least the *quantity* of his *aliment* ; and if he would continue free of great and dangerous distempers, and preserve his *senses* and *faculties* clear to the *last*, he ought every seven years to go on abating gradually and sensibly, and at last *descend* out of life as he *ascended* into it, even into the child's diet."

In conclusion, let me not be misunderstood. A trace of albumin and a few tube casts are danger signals, the red lights which may mean an open draw-bridge or a wrecked road ahead; but they may be simply warnings to the engineer to "go slow," that the pace is too rapid for the state of the track, and it is to the latter significance of the "red lights" that I wish to call attention.

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CONGENITAL ABSENCE OF THE ABDOMINAL MUS-
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PHIED URINARY BLADDER.

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Professor of Medicine, Johns Hopkins University.

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In the summer of 1897 a case of remarkable distension of [331]
the abdomen was admitted to the wards, with greatly dis-
tended bladder, and on my return in September, Dr. Fitcher,
knowing that I would be interested in it, sent for the child.
The accompanying figures, I and II, from photographs, show
a very remarkable and unusual pattern of "abdominal tumid-
ity," differing in an interesting way from the picture of the
dilated colon in children, and resembling rather that of the
ascitic abdomen.

The examination showed that the child had practically
no abdominal muscles.

On looking up the literature I can find reports of only two
similar cases. In the Clinical Society's Transactions (Vol.
28, 1895), R. W. Parker describes the condition of a newly
born infant, weighing five and a half pounds, with a very
large, flaccid abdomen, through which the outlines of the in-
testinal coils could be clearly seen, and the outlines of the
abdominal organs easily felt. The abdominal wall was as
thin as parchment. Along the middle line, where the rectus
muscles should be found, there was little more resistance
than over the lateral regions. The oblique and transversalis
muscles were apparently quite undeveloped. The umbilicus
was not depressed, it was in normal position, but resembled a
surface scar. The child died not long after birth. There
was no trace of any muscle representing the transversalis ab-
dominis. There was a thin layer of muscular fibres passing

[331] from the cartilages of the ribs to the level of the eighth costal cartilage, where there was the first linea transversa. The body of the muscle was well marked on the right, but on the

[332]

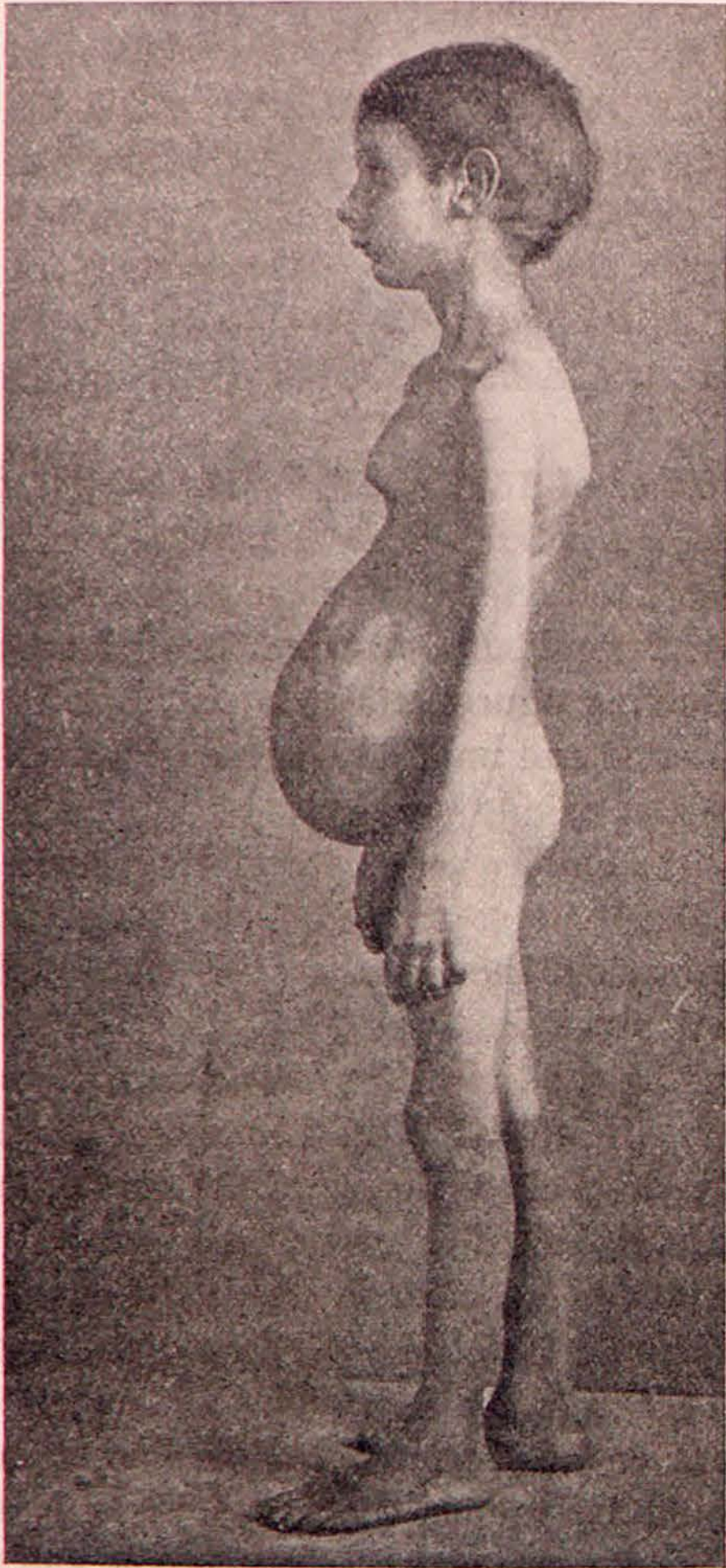


FIG. 1.

[331] left it was but faintly seen. Further down there was the merest trace of muscular fibres, representing the rectus on either side. The most remarkable associated condition in this case

was the enormous hypertrophy of the bladder, which was [331]
situated wholly within the abdominal cavity. There was no
obstruction anywhere in the urethra or prepuce. The open-

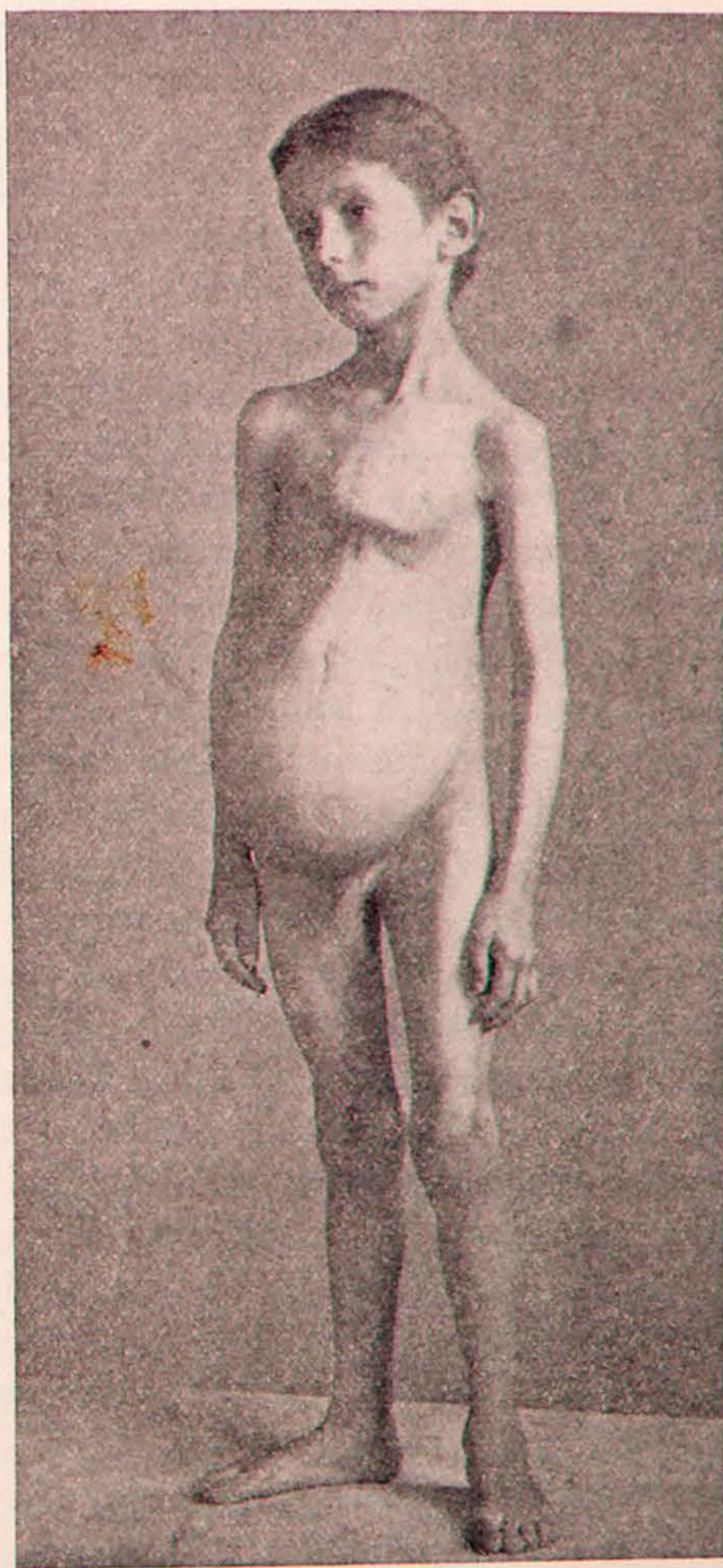


FIG. 2.

ings of the ureters into the bladder were quite free. The [331]
ureters and pelves of the kidneys were greatly dilated and
hypertrophied.

[331] In 1896, Dr. Leonard Guthrie reported to the Pathological Society of London (Transactions, Vol. 47), the history of a male infant, aged nine weeks, pigeon-breasted, very bony and emaciated, with a greatly distended abdomen. Extending between the pubes and the white, linear cicatrix corresponding to the umbilical scar there was a smooth, elastic tumor, corresponding to a distended gall-bladder. The abdominal walls were excessively thin and loose, and seemed to show the coils of the distended intestines on either side, but post-mortem these coils which looked like the intestines [332] proved to be the enormously dilated and convoluted ureters. The liver, spleen and kidneys could be easily palpated. The child wasted rapidly and died when about ten weeks old. Of the recti only the two upper segments as far as the second linea transversa showed muscular fibres. Below this level no trace of muscle could be discerned. The costal origins of the obliqui and transversales showed muscular structures for about two fingers' breadth below the ribs. The muscles of the back, of the thorax and of the extremities were well developed. Here again the most remarkable features related to the urinary organs. The bladder reached as high as the scar of the navel, and the walls were a quarter of an inch in thickness. The ureters were dilated to the size of the small intestines of an adult, and were remarkably tortuous. After death they exactly resembled, and at first were taken to be, portions of distended small intestine, as they were thought to be when seen through the weakened abdominal walls during life. The orifices of the ureters into the bladder admitted a blow-pipe. There was no obstruction in the ureters; there was no stricture of the urethra, and no phimosis. The kidneys were not enlarged, but the pelves were dilated. The position of the testes was not stated.

An important point in Dr. Guthrie's case was that there was no trace of a urachus, and the bladder was closely adherent to the inner surface of the umbilical scar, so much so that it could not be removed without the scar and the adjoining portions of the abdominal skin.

The history of my case is as follows:

Claudius K., aged 6, admitted July 13, 1897, complaining

of stomach trouble, and difficulty in passing the urine. The [332] chest has been deformed, the mother says, since birth.

The family history is good. One other child; well and strong; parents are healthy.

Personal History.—The child was well until the second summer, when he had severe stomach trouble. There have been recurrences of these attacks each year. From the account some of them have been gastric attacks, with nausea and vomiting, but others, and apparently the chief troubles, have been with the urine. The spells last four or five weeks, and they have been getting more frequent. In the intervals he is pretty well and strong, and has a large appetite.

His present attack began about a week ago, and he complained of pains in the abdomen and much burning sensation in passing water. He has become very weak; has not had any vomiting. He has had some headache.

The patient was a poorly nourished child, looking anæmic. He complained of much pain, chiefly in the hypogastric and [333] lower umbilical regions. On inspection the condition to be described was noted by Dr. Fitcher, but in particular there was a remarkable fulness in the hypogastric and lower umbilical regions, which were occupied by an ovoid mass corresponding to a dilated bladder. The urine which was obtained by catheter was free from albumin, contained a good many leucocytes. The child had a temperature ranging from 99° to 102°. He passed the urine very frequently, an average of from 60 to 70 cc. In the twenty-four hours ending 5.30 on July 13th he passed urine 20 times, a total amount of 1090 cc.; on the 14th he passed urine 18 times, a total amount of 835 cc.; on the 15th he passed urine 15 times, a total of 1060 cc.

The condition was so unusual that on my return in September the case was sent for, and on the 8th I dictated the following note:

In the erect posture the attitude is very remarkable. It is not quite symmetrical, being fuller on the right side than on the left. The navel looks stretched and distended. It is linear, forming a furrow about an inch in length, and below it are furrows in the skin—crow's feet. Above there is seen

[333] distinctly on either side the attachment of the recti to the sternum and costal margin. The skin over the abdomen is thin; the veins are a little prominent. When he bends back slight movements of the abdominal muscles beneath the skin are seen.

Recumbent.—Belly flattens out in front, extends at the flanks. Coils of intestines can be seen in peristalsis. Extreme relaxation of abdominal walls; no resistance; fingers can be passed everywhere to the spine. Three fingers can be passed under costal margin over liver nearly 6 cm. The edge of the liver can be felt in its whole extent, and the fingers can be thrust almost as far under it. The bladder could be felt as a firm ovoid body, reaching almost to the navel.

Spleen can be felt on deep pressure. Both kidneys can be felt.

He cannot raise himself off the bed without turning over. As he makes the attempt the abdomen is thrust forward and slight contraction is seen of the expanded abdominal muscles and recti.

The deformity of the thorax is very remarkable. Harrison's grooves are unusually marked, corresponding to the 6th costal cartilage. The lower portion of sternum is thrust forward, forming almost a right angle with the xiphoid cartilage. As shown in the photograph it is remarkably prominent, and is fully 3 cm. above the level of the skin in the intercostal furrows.

There is a condition of cryptorchidismus. The testes are not to be felt in the groins.

Remarks.—These cases illustrate a very remarkable form of congenital defect. The deficiency in the abdominal muscles, and the high position of the bladder are associated conditions due to arrest of development. We could not say definitely in my case whether the bladder was adherent to the umbilical scar. Dr. Guthrie regarded the hypertrophy of the bladder and the dilatation of the ureters as secondary, due to the fact that in his case, being firmly connected with the umbilical scar, it was unable to contract downward and to empty itself completely. In its effort to do so it became hyper-

trophied and dilated, and the accumulation of urine caused [333] backward pressure and dilatation of ureters.

In reply to a question, Dr. Bardeen, one of Prof. Mall's associates in the Anatomical Laboratory of the Johns Hopkins University, who has been specially engaged in a study upon the development of the muscles, writes as follows: "Two possibilities suggest themselves to me in the case:

"1. It is possible that the lack of resistance normally met with in the abdominal wall by the bladder at the time the kidneys begin to secrete urine may cause the bladder to expand rather than to empty secretions into the amniotic cavity through the urethra.

"2. Under normal conditions the growth of the abdominal musculature into the *membrana reuniens*, the early covering of the abdominal cavity, is preceded by the formation of a vascular plexus supplied from above by the internal mammary, from below by the epigastric artery. It is possible that an abnormal arrangement of the blood vessels in the embryo prevented the formation of this plexus, and impeded the growth of the abdominal musculature, and that at the same time circulating disturbances gave rise to the abnormal conditions found in the bladder and ureters."

INTERMITTENT CLAUDICATION.

BY

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In 1877 or 1878, when studying comparative pathology, I went one day to the country with some of the members of the Montreal Veterinary College to see an autopsy on a horse which had had a peculiar form of intermittent lameness. Dr. McEachran said the condition was well recognized, and had been described by the French writers, but it was very obscure. I have forgotten now the details of the autopsy, except that we found verminous aneurisms of many of the mesenteric vessels and of the iliac arteries. At the time I was much interested, and looked up Bouley's paper on *Claudication Intermittente*. He described an affection in the horse, in which, after being driven for fifteen or twenty minutes, the animal stopped, one or both of the hind legs got stiff, and soon it was unable to stir. In from half an hour to an hour it recovered and was able to go on comfortably for another fifteen minutes, when the attack recurred. In such cases, post-mortem, the artery of the affected limb was found blocked with a clot, or, when both hind legs have been involved, the abdominal aorta contained thrombi.

The subject was not brought to my attention again until a few years ago, when working at the subject of angina pectoris. I then looked up Charcot's description of this intermittent claudication in man, and made also the interesting discovery that Allan Burns in his *Observations on Some of the Most Frequent and Important Diseases of the Heart, 1809*, had given an explanation of this remarkable phenomenon.

One or two of his sentences I may quote: "In health, when we excite the muscular system to more energetic action than usual, we increase the circulation in every part, so that to support this increased action the heart and every other part has its power augmented. If, however, we call into vigorous action a limb round which we have with a moderate degree of tightness applied a ligature, we find that then the member can only support its action for a very short time, for now its supply of energy and its expenditure do not balance each other; consequently, it soon, from a deficiency of nervous influence and arterial blood, fails and sinks into a state of quiescence." He puts it very tersely when he says, "the supply of energy and expenditure do not balance each other."

Charcot was the first to describe a condition in man identical with that met with in the horse. His Memoir was presented to the *Société de Biologie* in 1856, and is also to be found in the *Leçons du Mardi, I.* One day a patient in the service told him that he was not able to walk for more than a quarter of an hour without being taken with cramps in the legs. After resting a while he would get better, and would be able to resume his walking, and then a crisis recurred. At the autopsy Charcot found a ball encysted in the neighbourhood of the iliac artery, and a traumatic aneurysm which had obliterated the artery in its lower part. The circulation was carried on by collateral channels, which were ample to maintain the nutrition while the patient was quiet, and for a short period during exertion, but after a time, when the limbs were fatigued by the movements, the quantity of blood which reached them was insufficient, causing a relative ischæmia, with tingling, cramps, and impossibility of walking. He refers to the fact that the condition is often preliminary to gangrene, and narrates a case in which a patient with the affection had his leg amputated for gangrene.

Interest has been reawakened in the subject by the very careful studies of Erb (*Deutsche Zeitschrift für Nervenheilkunde*, 13), in which he has reported twelve cases, and has called attention particularly to its association with arterio-sclerosis and calcification of the arteries of the legs. The whole subject, too, has been reviewed this year (1901) by Goldflam in the *Neurologisches Centralblatt*, and in this country cases have been reported by Gordon (*New York Medical Journal*, 1900), and by Riesman (*American Medicine*, 1901).

Familiar as I had been for years with the disease in the horse and with the early literature on the subject in Burns' work and with Charcot's description, I had never recognized the condition clinically until in the patients whose histories I here give.

Case I. *Vomiting and pain in abdomen—Pulsating tumor in epigastric region—History of syphilis—General arterio-sclerosis—Wiring and electrolysis of aneurismal sac—Marked improvement—Return in nine months with well marked intermittent claudication.**

W. B., aged 31, from Virginia, came first to the hospital in December, 1899, complaining of vomiting and great pain in the upper abdomen. These symptoms had been present for several months. He had lost in weight and had become very nervous. He had been a healthy fellow, but had had syphilis six or seven years before. The radials were sclerotic, the aortic second sound ringing and accentuated, and in the epigastric region there was a wide area of impulse; on palpation an expansile tumor which could be easily grasped in the hand. I urged him to have the sac wired. To this he consented and went home to settle his affairs. He returned early in January, and Dr. Finnie opened the abdomen and found an aneurism of the abdominal aorta, into which he inserted ten feet of wire, through which he passed an electric current for an hour. The patient did well and returned to his home very greatly benefited, particularly in the relief of the pain. He returned in October, 1900, for examination. He had continued free from pain and vomiting. His general condition was excellent, though he was still nervous and apprehensive. The sac was decidedly smaller and the area of pulsation much less.

He volunteered the statement that there was an additional symptom which had disturbed him not a little; namely, after walking for a certain distance his legs would, as he expressed it, give out completely; so that he could not move another step, and had to sit down. After resting a few minutes he could then go on again. This was more particularly noticeable when he walked on the street. He had to go very slowly and could not go for any distance. There was no paralysis accompanying the loss of ability to walk. He could move his legs, but there was an uncontrollable feeling that he could not take another step. Accompanying this there was a sensation of dead, heavy weight in the legs, but no cramps. Walking about in the house (and in the yard) did not bring on the condition, but he had had it very frequently in the past few months, and he had learned to ward it off by walking very cautiously and slowly and resting at intervals. The femoral arteries and the dorsal arteries of the feet were distinctly sclerotic.

* As I look over this paper for the press this patient has been readmitted to the hospital (January, 1902). He has remained very well since the operation two years ago. The aneurism can be felt. It is hard and firm. He has no pain, but is still very neurasthenic. He has not had the intermittent claudication for nearly a year.

In aneurism of the abdominal aorta the condition is the same as that which produces the intermittent claudication in the horse, and one can readily understand how, as Allan Burns expressed it, the supply of energy and expenditure did not balance each other. In fact, it is surprising that lameness is not more common in such cases.

The following case is a typical illustration of the more frequent cause; namely, general arterio-sclerosis. The patient had, moreover, the associated vaso-motor and nervous disturbances which are not uncommon with disease of the arteries of the extremities.

Case II. Mitral stenosis—General arterio-sclerosis—Attacks of intermittent lameness with numbness and tingling in the feet and marked vaso-motor disturbances—Absence of pulsation in the dorsal arteries of the feet.

Mrs. W., aged 55, admitted June 7th, 1900, complaining of pains in the right leg, difficulty in walking, and heart trouble. There was nothing of any special moment in her family history. Her mother died of tuberculosis, and probably one sister. She had had the usual diseases of childhood, and had acute articular rheumatism at sixteen. She had had seven children and five miscarriages. The last child was born seven years ago. She had always enjoyed good health, and had had no serious illnesses. She said, however, that she had had heart trouble all her life, and occasional attacks of shortness of breath.

Present Illness. While at Baden last August she went out for a walk after eating a very hearty dinner, and after going a little distance from the hotel she lost control of her legs. There was no pain, but they simply refused to carry her, and she had to be carried back to the hotel. There was no loss of consciousness. She was very much alarmed about herself, and she was given aromatic spirits of ammonia, which made her very nauseated, and a little while later she vomited. The following day she felt well enough to leave Baden. Prior to this time she had begun to suffer a good deal with dyspnoea on exertion. She stood the journey back to this country very well, and remained quite well until about six weeks ago. Walking rapidly one day to the boat at Norfolk, she got somewhat out of breath. She got on the boat all right, and felt quite well until she reached Fortress Monroe, when she found on attempting to get up she was unable to walk. She had at this time a feeling of pins and needles in her feet, chiefly in the right foot. There was no difference in the color, and no swelling. About three weeks ago it was noticed for the first time that the right foot and leg were slightly blue, and she has had a good deal of pain in this foot and leg, sometimes sufficient to require

morphia. For the greater part of the time since the attack she has been in bed. On attempting to move about the legs give way. The pain in the right leg is much intensified if the foot hangs down. She has been very much worried and disturbed about herself, but her general health has been pretty good. She does not think she has been more short of breath of late. She has had a little palpitation and pain about the heart. The dyspnoea is altogether on exertion.

Present Condition. The patient was a medium sized woman, quite stout and looked nervous. The tongue was clean. She gave a very good account of her history and condition. The radial pulse was regular, 96, vessel wall not sclerotic. No sclerosis of the temporal arteries. The pupils were equal, and reacted to light and on accommodation.

Heart. Point of maximum impulse was visible in the fifth interspace about the nipple line. There was an exaggerated systolic impulse on palpation; no definite thrill. On auscultation there was an extremely sharp, flapping first sound at the apex, almost amphoric in tone, and preceded by a short, rumbling murmur. There was a soft systolic bruit at the aortic area, and the second pulmonic sound was loudly accentuated.

The abdomen was not swollen; liver and spleen not enlarged.

Legs. Both could be moved freely in bed. Power of movement of right toes and ankle slightly impaired. The right leg looked cyanosed from the knee down. There was no œdema. It was extremely tender to the touch. The right calf measured the same as the left— $31\frac{1}{2}$ cm. Left leg and foot normal in size and color, and not tender to the touch. Both feet felt cold, the right more so than the left, and she complained very much of the numbness in them. There was no pulsation to be felt in the dorsal artery of the right foot, nor in the right popliteal artery. Slight pulsation to be felt in the femoral artery. No pulsation in the dorsalis pedis or popliteal arteries of the left leg. Pulsation in the left femoral was well felt. Pulsation in the external iliacs could be just felt. There were no patellar reflexes in either leg, and the plantar reflexes were very difficult to obtain as she winced so much from tenderness of the soles.

The patient had warmth applied to the legs, careful friction, and she did remarkably well. On the 11th there was no cyanosis in either the leg or foot. It was still cooler to the touch and tender. No pulsation could be felt in the femoral artery.

I heard subsequently from this patient's daughter that she died a month or two after leaving the hospital.

This case illustrated the good effects of careful treatment as recom-

mended by Erb. With rest in bed, warmth to the legs and careful friction she improved very much. She received great benefit too from the use of full doses of nitroglycerine.

A word as to the name. I think it is very much better to use the term intermittent claudication, though it does not specify the etiology. It expresses well the most characteristic feature of the complaint. Erb's term, *intermittirendes Hinken*, is simply the German equivalent. Other terms have been used, such as *angio-sclerotic intermittent dysbasia* by Charcot, *intermittent muscle paresis* by Erb, and *angio-sclerotic paroxysmal myasthenia* by Higier, the author of a long article on this subject in *Deutsche Zeitschrift für Nervenheilkunde*, July, 1901. As shown in the horse and in the first case which I here report, the affection is not always due to simple arterio-sclerosis, but may be due to aneurism, as in Charcot's case and as in the rule in the horse. Oppenheim has reported instances in nervous individuals in which the condition seems to depend upon vaso-motor disturbances.

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ON THE DIAGNOSIS OF BILATERAL CYSTIC KIDNEY.

BY

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The condition of bilateral cystic kidney is more often recognized at autopsy or discovered by the surgeon than diagnosed during life by the physician. In Montreal and Philadelphia I had dissected four cases of the kind in children or in adults, and it always seemed to me that the cases presented clinical features distinctive enough to enable one to make the diagnosis during life. Yet this, I believe, is very seldom done. Of the two cases which have been in my wards in the Johns Hopkins Hospital, in one the diagnosis was easily made.

CASE I.—A. W. N., male, aged 59, admitted October 3, 1893, with dyspnea. He had been a hard worker, with no history of any special excesses. He had been ill on and off for 10 years, chiefly with dyspnea and recurring attacks of shortness of breath. These had increased of late very rapidly, so that he had become incapacitated for work.

On admission he was orthopneic and cyanosed, with a rapid, feeble pulse. The heart was dilated and the impulse feeble and diffuse. On auscultation there was a gallop rhythm, but no murmur. There was marked sclerosis of the superficial vessels, and the case was thought to be one of general arteriosclerosis with secondary hypertrophy and dilation of the heart. The abdomen was enlarged and tense. The liver was greatly enlarged, reaching nearly to the navel. The spleen could not be felt. There was no note whether or not the kidneys were palpable. The abdomen was so distended and the liver was so large that it is quite possible they might not have been felt. The urine had a specific gravity of 1.016, a slight trace of albumin, and numerous granular casts; no blood. He had no history of hematuria.

For a week he remained in very much the same condition, with a marked gallop rhythm and shortness of breath, and signs of beginning effusion in the chest and abdomen. On the thirteenth he died suddenly.

Autopsy, No. 461.—There were found marked hypertrophy and dilation of the heart, general arteriosclerosis and emphysema. The kidneys were greatly enlarged, measuring 21 by 11 cm. They were universally cystic, the cysts ranging in size from a pea to an egg, containing clear yellow, and in some places turbid, material. There was no dilation in either pelvis, and the ureters were normal.

CASE II.—Florence S., aged 28 (Med. No. 9,479), admitted

January 21. Her parents were dead. She had one sister and two brothers, living and well. She had one sister, aged 30, who had had, so the doctor said, hemorrhages from the kidney. There was no history of tuberculosis in the family.

She had never had any serious illness. Nine years before she had chills and fever for a couple of weeks. She had always enjoyed good health. For three or four years she had been troubled with headaches, chiefly frontal. Once she had bleeding from the nose. She had had no shortness of breath. As a child and young girl, she took part in games without any trouble. Appetite and digestion had been very good. The abdomen had never been swollen. She did not have to rise at night to micturate; no increase in frequency during the day. Her menstruation had been regular. She had always had a somewhat sallow complexion.

Present Illness.—About a year ago patient noticed that for nearly a week the urine was of a blood-red color. There was no pain, no fever, no chills. She did not go to bed, and did not stop work. She had no further trouble until Monday, December 6, when at 10 p. m. she had a severe attack of pain in the right side, which was very sharp, and lasted until 3 o'clock the next day. She did not have a chill, and does not think she was feverish. The doctor thought she was passing a gallstone. The day previous to this attack she noticed that the urine was bloody; and it remained so for nearly two weeks. She did not notice that there were any clots in the urine. She remained in bed for nearly three weeks on account of the prostration and weakness following the loss of blood. The pain in the left side persisted at intervals, coming on in paroxysms. She thinks she was yellow for some days at this time. On December 6, she noticed for the first time that there was some distention of the abdomen, and she thinks that for some time she had felt the waistband to be tight. Since the attack there had been increasing frequency in micturition during the day, sometimes every hour and a half. She did not think that she passed more urine at one time than at another. She had not had headaches for nearly a month before the attack. When the pain was very severe she had vomiting with it. The week after she got out of bed, she noticed that her feet were a little swollen, and that the eyelids were puffy. The bowels had been regular.

Condition on Admission.—She was a healthy looking, well nourished woman, skin rather sallow, mucous membranes a little pale, no edema. The pupils were equal. The pulse was 76, of good volume, tension plus. The radials and temporals were sclerotic. The thorax was well formed, expansion good; the lower left axillary region appeared fuller than the right.

There was slight general pulsation over precordia. In fifth interspace the impulse could be felt in the anterior axillary line. The point of maximum impulse was in the fourth interspace, 9 cm. from the midsternal line. The relative cardiac dullness began at the upper margin of the third rib, did not pass to right of midsternal line, and at the fourth rib extended $8\frac{1}{2}$ cm. from the midsternal line. There was a soft systolic murmur at the apex. The second sound was sharply accentuated. The diastolic shock was well felt.

Abdomen.—The skin of the lower part of the thorax and abdomen generally was decidedly more pigmented than the other parts of the body. There was fulness in both flanks, more in the right than in the left. The respiratory movements were slightly diminished; no peristalsis. The right flank was

occupied by a large tumor which could be grasped between the hands, and which descended slightly with deep inspiration. It was a little irregular on the surface, not at all sensitive. In the left flank a second tumor could be made out, feeling rather larger and fuller than the one in the right. It reached a point $3\frac{1}{2}$ cm. to the left of the middle line, and below to about 3 cm. above the crest of the ilium. It was irregular, and presented numerous nodular bodies on the surface. It felt much more superficial than the tumor on the right side. It descended very slightly with inspiration. The percussion note over both tumors had a dull tympany. Both tumors became much more prominent and could be much more readily felt when the patient assumed the knee-chest position. The spleen was not palpable. The liver flatness began on the middle of the sixth rib in the parasternal line, and extended to the costal border. The gallbladder could not be felt.

Blood.—Red blood-corpuscles, 2,400,000; hemoglobin, 40%; leukocytes 6,000.

Urine.—On admission 900 cc., straw-colored, specific gravity 1,007, distinctly acid, slight trace of albumin; the catheterized specimen after centrifugalization showed a few red blood-corpuscles, no casts. Urea, 7.2 grams. A daily analysis was made of the urine during her stay in hospital. The specific gravity was persistently low. In the 19 examinations of the urine made during her stay, in only one did the specific gravity reach 1,009, usually it was 1,007 and 1,008. There was always a slight trace of albumin, and as a rule a few red blood-corpuscles. Once, on February 6, a hyaline cast was seen. An exceedingly interesting point was that on February 5, cholesterin crystals were seen in the urine. The amount of urine rarely reached above one liter; on February 2, she passed three liters. The urea ranged from between 5 and 6 grams the lowest, to 19 grams the highest. She had no fever.

A diagnosis of bilateral cystic kidney was made on the basis of the presence of the tumors in the flanks, recurring hematuria, with the cardiovascular and urinary changes of a sclerosis of the kidneys. The patient left the hospital February 11, 1899, feeling very comfortable.

She was readmitted on February 27, 1900, in a condition of urgent dyspnea. From her friends it was learned that she had remained well and had been at work. She had at times passed bloody urine. For four days she had only been able to speak in a whisper, and had great difficulty in getting her breath. She said that it hurt her when she swallowed, and the trouble was altogether in the throat. She had frequently had attacks of vomiting, and on the morning of admission spat up thick blood clots. She had no fever, no chills.

The patient was in great distress, and it was rather difficult to get an answer. When admitted she was breathing 20 to the minute, very labored and loud and noisy. The *alæ nasi* were dilated, and all the accessory muscles of respiration were in action. The heart's impulse was visible and forcible. She had a very bad night and became cyanosed. The thorax was clear. There was nothing to be seen on careful examination. Examination of the throat showed a few small patches of exudate, but there were no diphtheria bacilli in smears, and subsequently none grew on the cultures. At 6 p. m., on February 28, she became so cyanosed, and there was such distress that Dr. Baer performed tracheotomy. The difficulty in respiration was not at all relieved; the respirations were as full and labored,

and there was the same retraction of the lower sternum and interspaces. The tube was perfectly clear, and a large volume of air passed in and out, apparently without obstruction. As it was thought that possibly she might have laryngeal diphtheria, antitoxin had previously been given.

She sank gradually and died at 5 a.m. on March 1. The urine examined during this admission showed a specific gravity of 1.013, many red blood-corpuscles, no casts, urea 3 grams to the liter. The examination of the abdomen showed the presence of 2 large tumor masses, and Dr. Fletcher thought that the left had increased in size, and in comparison with the charts previously made it evidently had increased a good deal.

Autopsy No. 1,498, performed by Dr. McCallum: Before opening the abdomen a mass was felt on the left side extending to the level of the crest of the ilium, and centrally to within 2 fingers' breadth of the navel. On the right side the mass was not so large, but it could be felt in the right hypochondriac and in the right epigastric region.

The abdomen was opened with a crucial incision. The stomach was vertically placed and the lesser curvature made an acute angle reaching nearly as low as the navel. The edge of the left lobe of the liver reached 8 cm. below the costal margin. The cecum bulged in the right iliac fossa. The transverse colon was below the level of the navel, and had a pear-shaped fold reaching to the pubes. Neither kidney could be seen. On lifting the splenic flexure of the colon an enormous cystic kidney was seen. The cysts were plainly seen through the peritoneum. On the right side the hepatic flexure of the colon turned directly over the kidney and was attached to the duodenum. When the intestines were turned to the right the lower end of the left kidney was seen to extend to within 3 cm. of the promontory of the sacrum. The relations of the duodenum to the kidneys were interesting. On the right the first portion of the duodenum lay directly upon the cystic kidney. The terminal portion of the duodenum was in direct contact with the left kidney for 6 cm.

The left kidney was 22.5 cm. long by 9.5 cm. wide, and reached above to the sixth interspace in the mammary line. The pancreas lay directly over it for most of its length. The spleen was above it, but was not adherent. The organ consisted of a congeries of cysts, some with clear, others with dark-colored contents. It weighed 1,400 grams. The ureter was normal. The upper end was formed of one large cyst nearly 9 cm. in diameter.

The right kidney was 16 by 9.5 cm. and reached upward to the level of the seventh interspace in the nipple line. It weighed only 950 grams. It had the same contents. The mucosa of the pelvis and ureters was normal.

There was marked hypertrophy of the heart and general arteriosclerosis.

These two cases illustrate very well the general features of polycystic kidney, and one of them the facility with which the diagnosis can be made in the presence of a characteristic combination of symptoms. These are: First, the presence of bilateral tumors in the flanks. Polycystic kidney is rarely unilateral. Of the 88 cases collected by James Ritchie (Laboratory Reports,

Royal College of Physicians, Vol. IV), in all of the cases except two both kidneys were involved. Of the 62 cases tabulated by Lejars only one was unilateral. The tumors are often unequal in size, as in Case II here reported. There is no difficulty in recognizing that the tumors are renal. In Florence S. the tumors could be readily grasped bimanually, and the situation and mobility left no question at all that they were enlarged kidneys. This circumstance alone should at once arouse suspicion, as other forms of bilateral renal tumor are excessively rare.

Secondly, the cardiovascular changes of interstitial nephritis. In Case II these were very pronounced—the sclerosis of the arteries, the dislocation of the apex beat to the left and the accentuation of the aortic second sound.

Thirdly, the condition of the urine, which is that of advanced interstitial nephritis. In Case II it was very characteristic—the low specific gravity, the slight trace of albumin, a few red blood-corpuscles and scanty tube-casts. An exceedingly interesting feature in her case, which I do not see mentioned, was the presence of cholesterolin crystals in the urine.

Fourthly, hematuria, which in Case II had recurred in attacks for more than a year. It was present in 19 out of 78 cases (Morris). It may recur in paroxysms, as in Case II, and be associated with much pain.

While the local symptoms, such as pain and tumor, may be well marked, it is the cardiovascular, gastric and pulmonary features of interstitial nephritis which attract attention. That the diagnosis has been made so rarely, in only 5 out of 62 cases, according to Lejars (quoted by Morris) is owing to the fact that the patients are seen (as was Case I) with signs of cardiac insufficiency and dyspnea, and no attention is directed to the kidneys; or they are attacked with sudden coma or uremia. Once the attention of the physician is called to the characteristic combination of symptoms, the diagnosis is very readily made.

In these operative days the question of diagnosis has a very practical aspect. At a medical society I saw a surgeon exhibit a very large cystic kidney, which he had just removed. I asked whether the other kidney had been examined, as the condition was almost always bilateral, and he replied that he had not had his attention called to it. The patient died in a few days with symptoms of uremia. As a rule, in polycystic disease

operation is contraindicated, since removal of one kidney simply takes away one-half of the already reduced kidney tissue available for excretory purposes. Even in unilateral cases it is stated that the remaining kidney may become cystic after a few months. Mr. Henry Morris, in his recent treatise on *Surgical Diseases of the Kidney and Ureter*, states that he has operated on three cases of unilateral disease, and in two of them the patients were alive and well several years after, and he states that "when the opposite kidney has been ascertained, either by inspection or palpation, to be unaffected, we are not justified, in my opinion, in refusing a patient the relief from severe pain or hemorrhage, or from the dangers of infection from suppuration of the cysts, which nephrectomy affords."

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**ON AMEBIC ABSCESS OF THE
LIVER.**

BY

WILLIAM OSLER, M.D.,

OF BALTIMORE.

FROM

THE MEDICAL NEWS,

NEW YORK,

APRIL 12, 1902.

ON AMEBIC ABSCESS OF THE LIVER.¹

BY WILLIAM OSLER, M.D.,

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By far the most frequent form of abscess of the liver met with in this locality is that which is secondary to the amebic dysentery of which it is by far the most frequent and serious complication. The relative frequency may be judged from the fact that of some 93 cases of amebic dysentery which have been admitted to the wards, abscess of the liver occurred in 23 as a complication. Naturally this very high percentage is owing to the fact that only the more serious cases are admitted, and a considerable number of these, of course, come into the hospital for the hepatic symptoms and not for the dysentery.

Within the past three or four months we have had a rather unusual series of five (possibly six) cases, illustrating many interesting points in the clinical history of abscess of the liver. You have had many opportunities of studying these cases, and I purpose this morning to review their histories in order that I may impress upon you the chief features.

Case I.—Clinical Summary. No history of dysentery. Illness of four weeks' duration. Pain in the right side. Swelling over the sixth and seventh ribs. No enlargement of the liver. Remarkable persistent cyanosis. Operation. Opening and draining of an abscess of the liver. Recovery.

The patient, Thos. E., aged thirty-two years,

¹ A Clinical Lecture delivered at the Johns Hopkins Hospital, Feb. 15, 1902.

admitted Oct. 18, 1901, had been a healthy man, with a good history. He had not had dysentery. He entered the hospital complaining of pain in the right side below the ribs. His illness had begun four weeks before admission with a chill, followed four days later by pain in the right side, not severe enough to make him take to bed. This pain had gradually increased, and was most intense beneath the lower ribs on the right side; it was especially severe after eating and frequently radiated to the shoulder. Shortly after the onset of his illness he began to notice that he passed mucus in the stools, but there was no blood, and he had only one or two movements in the twenty-four hours. He had several slight night-sweats; no chills, no jaundice. His appetite and digestion were good, and the patient felt well except for the pain and a sense of weakness. One remarkable feature in his case was the diffuse cyanosis, a general blueness of his face and hands which he had noted about two weeks after the onset of his illness. On admission this lividity was very striking. On the right side over the sixth and seventh ribs there was a swelling between the parasternal and midaxillary lines. There was no redness and no heat over it. There was tenderness on light palpation, and on deep palpation it gave a boggy sensation. The right costal margin was a little more prominent than the left, and the right rectus was held a little tense. The liver flatness began at the fifth rib and extended two centimeters below the costal border. The edge could not be felt. The spleen was not palpable. Examination of the other organs was negative. The stools showed no amebæ. The leucocytes were 6,825 per cubic millimeter. An extraordinary feature was the general diffuse cyanosis. He constantly looked as if he had just come out of a cold tub. The

hand forcibly pressed upon the skin of the chest or back left an area of anemia which was very slowly obliterated. His temperature was normal. He was under observation until November 11th, and, with the exception of the swelling over the sixth and seventh ribs and a slight pain, there were no symptoms. The liver was not enlarged and there was no tenderness on deep pressure over the liver, either in the axillary region or at the tip of the tenth rib. The intercostal

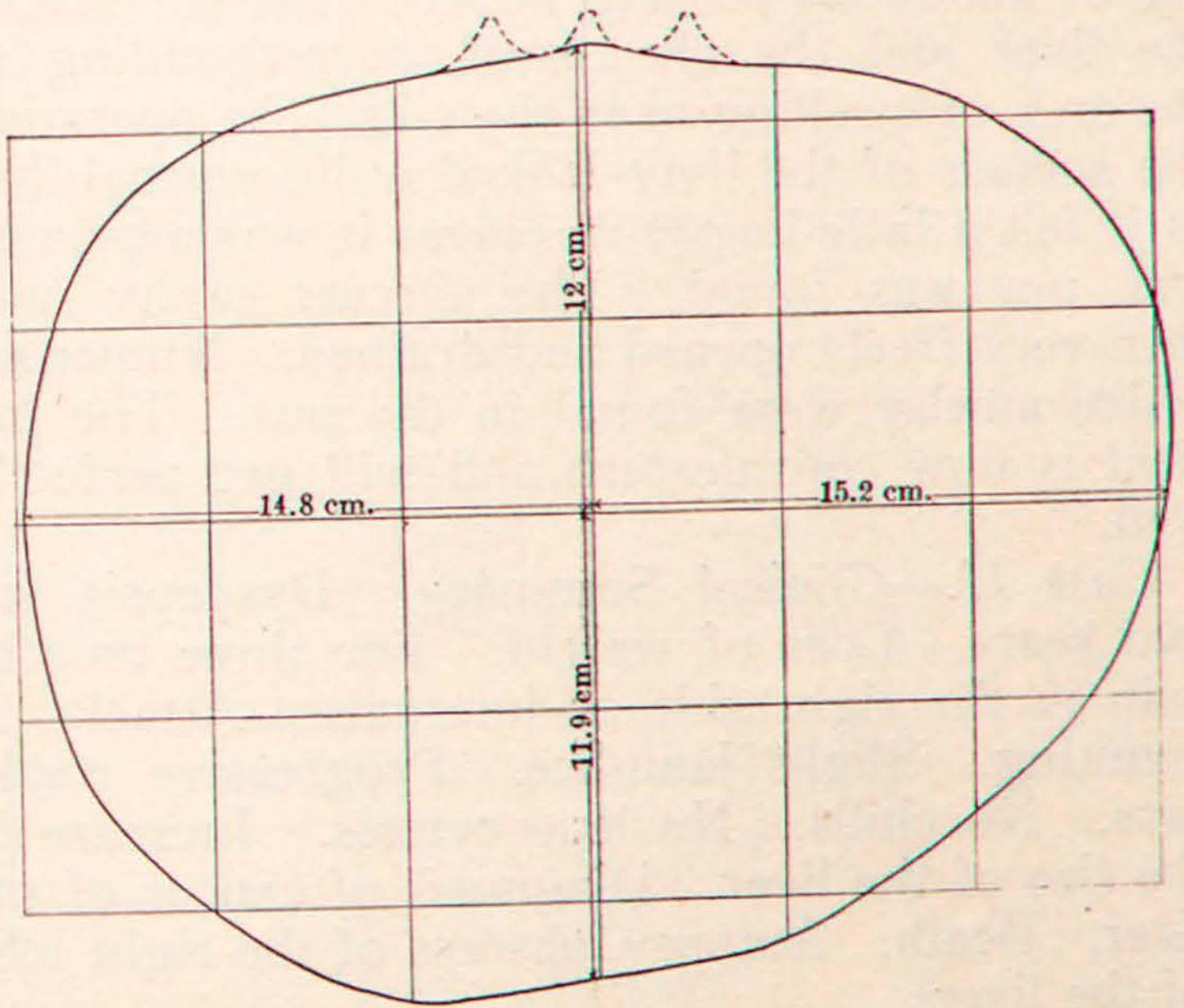


Chart 1. Cyrtometric tracing in Case III., showing the enlargement of the right half of the thorax.

spaces on this side were not obliterated. The swelling persisted, but did not increase. It was particularly to be noted that his temperature was normal; he had no chills; there was no leucocytosis. On the night of November 6th he had a heavy sweat. I discussed the case frequently with Dr. Halsted, and I must say we could not arrive at a positive diagnosis. I inclined to the

view that he had necrosis of the ribs from some cause, and, though the diagnosis of abscess of the liver was suggested, the negative character of the symptoms rather pointed against it. The leucocytosis on the 7th rose to 11,000, and he was transferred to the surgical side.

On the 11th Dr. Halsted operated, and found that there was only an area of infiltrated tissue over the region of the swelling; there was no necrosis of the ribs, but there was a remarkable tag of adhesions passing between the surface of the liver and the chest-wall, corresponding to the area of swelling over the ribs. At operation the surface of the liver looked quite normal, but as it felt a little boggy in places it was aspirated and pus was found. The abscess cavity was then very freely opened and drained. Numerous active amebæ were found in the pus. The patient is now convalescent and will get perfectly well.

Case II.—Clinical Summary. Dyspepsia for two years. Loss of weight. For three months pain in the right side at intervals. Attacks of vomiting. Slight jaundice. Progressive weakness. No chills. No leucocytosis. Increase in the size of the liver. Diagnosis of cancer of the liver. Death. Autopsy, abscess of the right lobe of the liver.

Amelia B., aged sixty-four years, admitted November 11th, complaining of pain in the right side. For many years she had had dyspepsia and had been very nervous. For two years she had been losing in weight. Her present illness began thirteen weeks before admission, with a sudden severe pain in the right side, which lasted for two days and then subsided; she has had it at intervals ever since, particularly with nocturnal exacerbations; it is usually in the lower part of the right side and radiates to the front of the

abdomen, never to the shoulder. She has had frequent attacks of vomiting, particularly at night when the pain is worse. The bowels have been constipated, except at the onset of the illness, when she passed a little blood in the stools. She has grown progressively weaker and has lost in weight. During the past few weeks she has

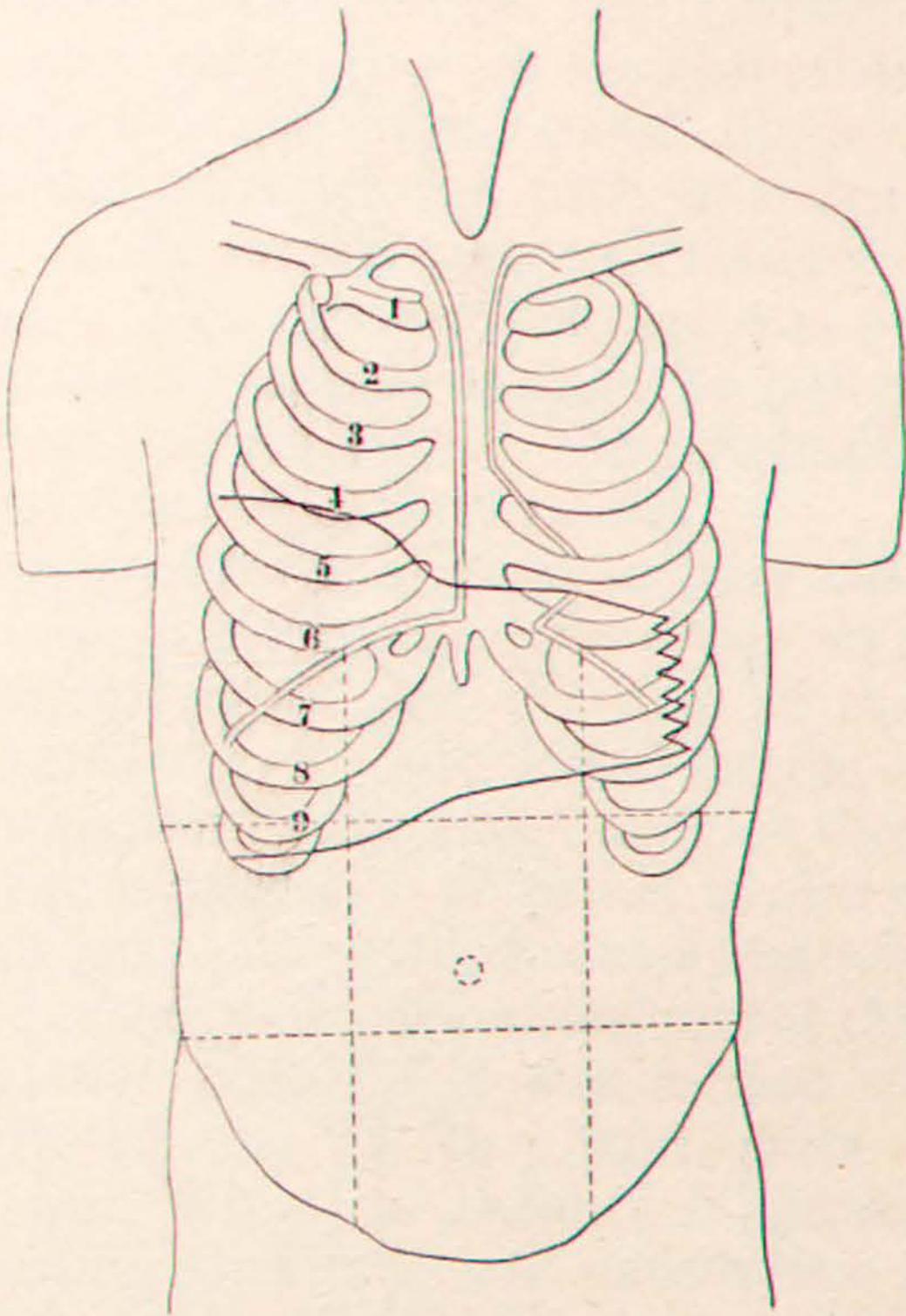


Chart 2. Showing the upward enlargement of right lobe in Case III.

become slightly jaundiced. The abdomen was full and large; there was tenderness below the right costal border; no special tenderness over the gall-bladder, but deep under the costal margin there was a firm hard mass to be felt, which descended with inspiration. The edge of the liver could be felt all along the costal border. She

had no fever and the leucocyte-count was only 10,000. The stools were clay-colored. They were not examined at the time for amebæ, as there was no suspicion of abscess. She remained in the hospital two weeks and improved very much; she was afebrile throughout and was discharged very much better on November 26th.

She returned on December 30th, complaining

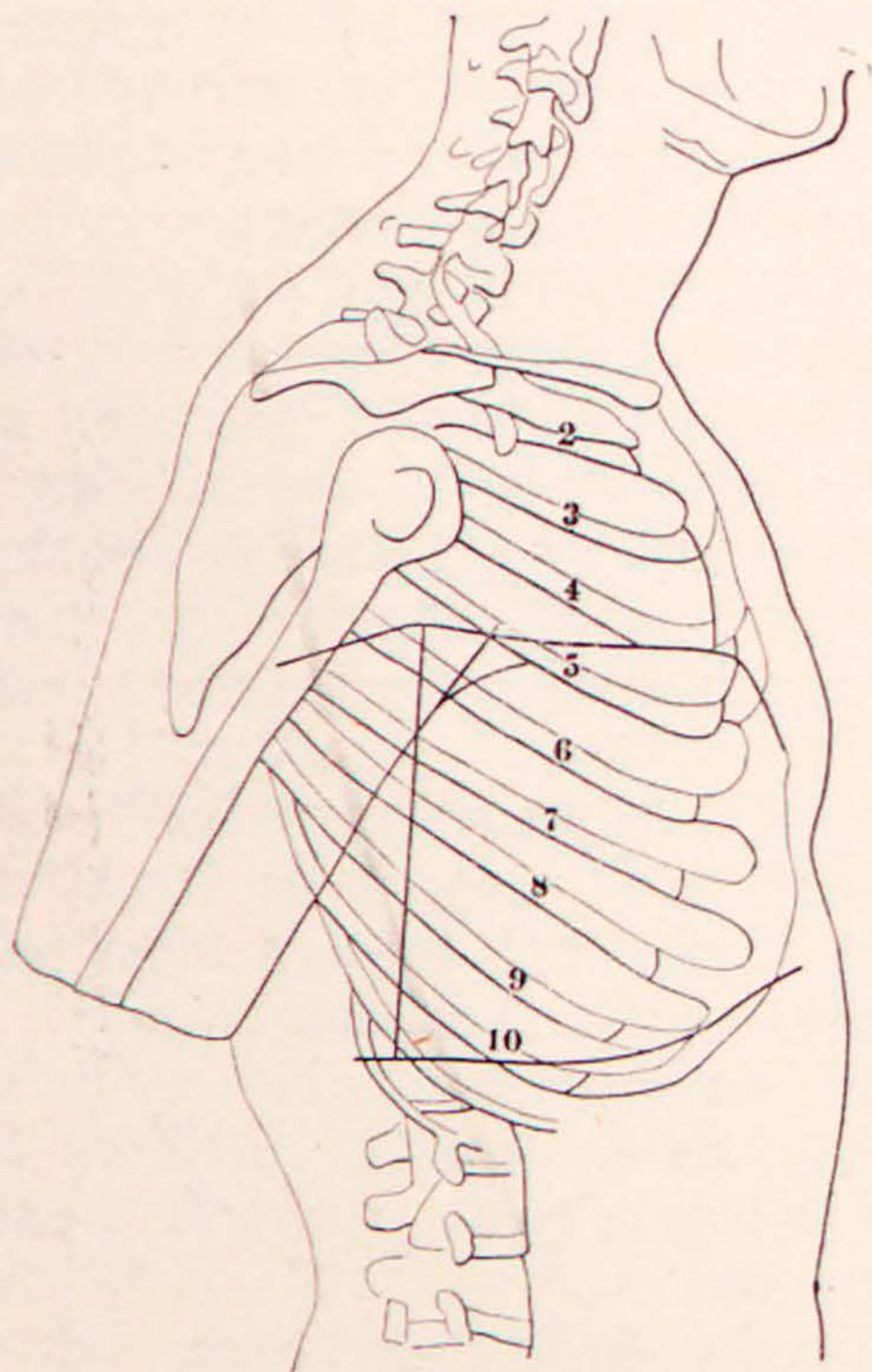


Chart 3. Showing the high limit of liver dulness in Case III.

of a great increase in the pain in the side, particularly on movement. She had a great deal of nausea, vomiting and insomnia. She was sallow, but not jaundiced. The edge of the liver could be felt three finger-breadths below the costal border, and there was irregularity of the

edge. During the month she was under observation she had slight fever, ranging occasionally to 101° F.; usually it was not above 99° F. She had no chills, no diarrhea; the stools were clay-colored; no bloody mucus. There was a trace of bile in the urine. The leucocytes were only 8,800. The liver gradually increased in size. The abdomen was difficult to palpate, as it was full and large, but a nodular mass was made out below the right costal border. The liver flatness began at the fifth interspace, and gradually, as the liver increased, extended almost to the navel. The pain in this case was peculiar. Any movement caused it, and the patient suffered a great deal at night. She gradually grew weaker and died on February 2d.

The autopsy showed a large, solitary abscess of the right lobe of the liver. There was no ulceration in the intestines. At the time of the post-mortem, amebæ were not found in the superficial examination of the pus, but later they were seen in large numbers in a section of the wall of the liver abscess. We had no suspicion whatever in this case of the existence of abscess of the liver. I thought that possibly it was a case of gall-stones with cancer, as the pain came on so suddenly, but, while no definite diagnosis was reached, strong suspicion was entertained that it was cancer of the liver. The organ increased rapidly in size. There were no chills, no sweats and no leucocytosis, and the pain was not greater than one sees sometimes in rapidly-growing carcinoma.

Case III.—Clinical Summary. Dysentery five months before admission. Gradual improvement. Recurrence. No chills. Progressive weakness. Amebæ found in the stools. Characteristic signs of abscess of the liver. Litten's sign in the fifth

interspace. Operation refused. Discharge. Rupture of abscess into lung. Death.

Joseph S., aged twenty-nine years, admitted December 9, 1901, complaining of trouble in the abdomen. He had been a healthy man, an Austrian, who had lived in this country for seven years. He had been a sailor and had been on repeated cruises. He had not been out of Maryland for four years. Five months ago he had had a severe attack of dysentery which was very severe for three or four days and had continued ever since. He was treated in Brooklyn, N. Y., for typhomalaria, and subsequently, by another doctor, for spinal disease. He had been getting progressively weaker. His dysentery improved and for some time he was constipated. Two weeks ago he began again to have diarrhea and passed some mucus. He had had no chills.

On admission the patient looked ill and pale. His temperature was normal, but rose to 101.5° F. in the evening. The thorax was asymmetrical, bulging on the lower right side, as shown very well in the accompanying cyrtometric tracing (Chart I.). The liver was enlarged and there was a marked fulness in the epigastric and right hypochondriac regions. There was nowhere any tenderness. The liver could be seen descending with inspiration. Charts II. and III. (outlined by Dr. McCrae) show very well the interesting increase in the area of liver flatness. The measurements were 17 cm. in the nipple line, $16\frac{1}{2}$ cm. in the parasternal line, 16 cm. in the mid-axillary line. The left limit of liver flatness was somewhat doubtful. One point of very great interest was a very definite Litten's diaphragm phenomenon in the fifth interspace. Never do I remember having seen the diaphragm phenomenon so high, and it was almost evident from it alone that the bulging and fulness were not due

to empyema. In the mucus of the soft stools amebæ coli were found.

On the following day the patient was aspirated and a creamy, glutinous pus obtained, chiefly made up of granular debris and a few cells looking not unlike liver cells. No amebæ were found in it. In this case too the leucocytes on the 9th were only 9,000, and on the 10th practically the same, red blood corpuscles 4,500,000, hemoglobin 51. He had not a particularly septic look, nor was he jaundiced. The patient was urged to have an operation, but he refused and went home. There was nothing of special moment in the urine. His temperature ranged from 97.5 to 101.5° F. At his home the abscess ruptured into the lung and he spat up a large quantity of pus. He grew progressively weaker and died about February 5th.

In this case the history of dysentery and the patient's condition on inspection were almost sufficient in themselves to make the diagnosis. The high situation of the diaphragm phenomenon was a most interesting feature.

Case IV.—Clinical Summary. Imperfect history. Marked cough. Pain in the right side. No sweats, irregular fever. Leucocytosis. Diagnosis of empyema. Operation. Multiple abscesses of the liver. Drainage of a large one. Death. Autopsy.

Jos. K., aged forty years, admitted December 4, 1901, complaining of pain in the right side and fever. He was a Pole, did not speak English, and the history was difficult to obtain.

His present illness had begun two weeks before admission with a severe pain in the right side, which was exaggerated as the patient drew a deep breath. He had had no definite chills, but did have chilly sensations. He had had marked

cough from the onset and spat up blood once during the first week. He had had no sweats. The bowels had been regular.

On admission the patient looked ill, had a sallow, gray, septic appearance, and was somewhat cyanosed. Respiration was increased. He had a full, emphysematous chest. On the right side there was flatness to the fourth rib with distant breath sounds and diminished vocal fremitus. When sitting up the flatness reached to the lower border of the third rib. Over the dull area there were diminished vocal fremitus and distant breath sounds. The heart impulse could not be localized. The abdomen was full, particularly in the epigastric region. The edge of the liver could be felt 4.5 cm. below the costal border. There was a leucocytosis of 22,800. The temperature range for the first few days was between 100 and 104.5° F. A needle was inserted in the sixth left interspace in the mid-axillary line and pus was obtained. The patient was transferred at once to the surgical side.

The eighth rib was resected and when the pleural cavity was opened it was found normal. The wound in the pleura was then closed, and the following day a large abscess of the liver was evacuated through an incision in the diaphragm. Amebæ in abundance were found in the pus. The patient died on the 9th.

The autopsy showed multiple abscesses of the liver and small ulcers in the colon. The case was a hopeless one for surgery. There were numerous large abscesses, and it would not have been possible to reach them by any surgical procedure.

Case V.—Clinical Summary. Five months before admission an attack of dysentery. Subsequently an illness supposed to be typhoid fever with irregular temperature and night sweats.

Sudden attack of coughing in which he spat up large quantities of pus of a reddish-brown color. Signs of a hepato-pulmonary abscess. Amebæ in the pus. Patient recovering.

J. H. B., of Virginia, colored, aged forty-six years, admitted January 23, 1902, complaining of weakness. During last September and October he had an attack which was supposed to be typhoid fever. He had diarrhea for three or four days with mucus and blood in the stools, which were from three to seven in the day. A number of people in his neighborhood had attacks of the same character. On September 18 he had an attack of cramps in the stomach, headache, fever and pain in the right side. After this he was ill for three weeks with what the doctor called typhoid fever. Then he had irregular fever for several weeks with severe night-sweats. On November 9, during the night, he had an attack of coughing of great severity, during which he spat up a large quantity of blood and pus. The attacks of coughing have persisted ever since and every morning he coughs up reddish-brown mucus. He has had no pain since November 9, but has been growing weaker.

On admission he was looking fairly robust; there was a bulging in the right lower thorax, especially behind and in the flanks, and there was a little fulness at the right costal border. There was flatness in the right side beginning at the fourth rib and extending into the axilla and as high behind as the lower half of the scapula. The breath sounds were suppressed. Just beyond the posterior axillary line there was a region in which large gurgling râles were heard when he coughed and there was a friction sound in the right axilla. The edge of the liver was not palpable. There was no blood and no mucus in the stools and nothing was found on passing the rec-

tal tube. He had a leucocytosis of nearly 15,000 and a decided anemia, the red blood corpuscles numbering only a little over 2,500,000.

When I saw this patient a few days after his admission I was at once struck by the character of the sputum, which looked very much like that which we have learned to recognize as almost characteristic of liver abscess discharging through the lung. No amebæ, however, had been found in it. On the 24th, Dr. Warfield inserted a needle deep between the eighth and ninth ribs in the posterior axillary lines and drew off a brownish-red, very grumous-looking pus which contained motile amebæ.

As we had several cases in which the abscess had been discharged through the lung and the patients had made a good recovery, we thought it best to wait a few weeks before operating. He is now very much better. His expectoration has diminished, his cough is not nearly so severe, his temperature is normal, and he is gaining in weight. The right side of the chest has become flattened, there is less expansion and the intercostal spaces are very much narrowed. There is flatness to the fourth rib. There is everywhere feeble breathing over the dull region, and on coughing one can hear medium-sized râles.

I may briefly refer to a case at present in the private ward, which I have been seeing at intervals with Dr. Thayer—a man from Norfolk, who has had recurring attacks of amebic dysentery for the past six or eight months. He came into the hospital in a condition of great emaciation, with very frequent evacuations, and for some weeks we were very doubtful about his recovery. With careful irrigations and dieting he began to improve, and early in February the dysentery seemed to be cured entirely. He improved in color and altogether has done remarkably well.

For between two and three weeks he has had persistent pain in the right side, far back under the edge of the ribs, and the liver has been increasing in size, so that it is now three finger-breadths below the costal margin. He has a little fever every evening, up to 100° F., a slight leucocytosis and every night a sweat, but he is gaining in weight, and during the past week he gained some two or three pounds. The question is whether he, too, has not an abscess of the liver.¹

Several points are illustrated in these five cases.

Latency.—In Case I. the abscess was not large and the features of the case were singularly negative, there being absence of fever, of chills, of sweats and of leucocytosis, until just before the operation. There were, however, two features worthy of special comment, viz., the remarkable diffuse cyanosis, for which I cannot offer any satisfactory explanation, and the localized swelling above the right costal border, which is sometimes seen in abscess of the liver which approaches the surface and is preparing to perforate. At operation, however, this was found to be associated with a group of adhesions between the liver and the costal margin, but there was no necrosis and no sign of the abscesses actually pointing in this situation.

The Liability to Error in Diagnosis.—I must say Case II. was what Niemeyer used to call “a mortifying postmortem disclosure.” A few days after her admission the patient was seen with a view to the possibility of surgical interference, but the symptoms seemed to point so strongly to malignant disease that we did not think it worth

¹After the delivery of the lecture this patient's liver increased in size, the bulging in the right flank became more marked, and on March 8th Dr. Finney operated and evacuated an enormous abscess. A point of very great interest in this case is the fact that there was progressive increase in weight and the general condition was good. He had been sitting up and looked well.

while to put her to the trouble of an exploratory operation. As the specimen showed, operation might have done good, as the abscess could have been easily evacuated. Such a case makes one strongly in favor of the exploratory incision for diagnostic purposes.

Case IV. illustrates one of the commonest errors in diagnosis, the mistaking of a large abscess projecting upward into the lung for empyema; nor is the diagnosis always cleared up by the exploratory needle. Large abscesses toward the surface of the right lobe pass high into the pleura in the direction of least resistance and the features may simulate closely those of a right-sided exudate.

Case V. as seen to-day would be readily taken for a case of empyema which had perforated into the lung and was healing, but the character of the attack following dysentery, the sudden expectoration of the anchovy-sauce-like pus and the presence of amebæ were sufficient to settle the diagnosis.

Leucocytosis in Abscess of the Liver.—A point of very considerable interest is the question of leucocytosis in amebic abscess of the liver. From the history of these cases and of others, too, some of the statements on this point need revision. In Case I., on admission, the leucocytes were only 6,000 per cubic millimeter and only once rose to 11,000. In Case II. the leucocytes were only between 8,000 and 10,000 per cubic millimeter. In Case III. they were only 9,000 per cubic millimeter. In Case IV. there was a leucocytosis of 22,000, and in Case V. a leucocytosis of 15,000. Three of the cases, as you see, had practically no leucocytosis. The strong statements as to the invariable presence of leucocytosis in abscess of the liver—made even, I am sorry to say, in the

recent fourth edition of a text-book of medicine in which I am interested—require to be modified.

Lastly, amebic abscess of the liver is not always associated with existing ulceration in the intestines, as is shown by the postmortem in Case II. The patient may have had dysentery months before and the ulcers may have healed completely.

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NOTE ON THE OCCURRENCE OF ASCITES IN SOLID ABDOMINAL TUMORS.

By WILLIAM OSLER, M. D.,
of Baltimore, Md.

Professor of Medicine, Johns Hopkins University.

The interesting lecture by Dr. Eden in the *Lancet* of February 8th., on the two cases of solid abdominal tumor with ascites, calls attention to a not sufficiently recognized cause of abdominal dropsy. In 1885, I saw with Dr. Walker, of Dundas, Ontario, a woman with recurring ascites, of doubtful origin, for which she had been tapped many times. Fortunately I saw her a day or two after the removal of the fluid, and was able to feel a tumor in the lower part of the abdomen. A week later, Dr. Thomas, of New York, removed a solid ovarian growth, and the patient has been well ever since.

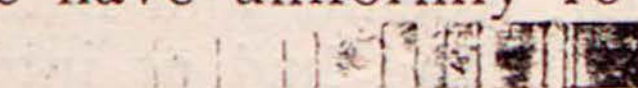
My interest in the subject has been renewed recently by a very remarkable case referred to me by Dr. Koehler and Dr. Fackler, in a woman, aged 53, who had had at intervals for three years attacks of ascites. Within the past four months she had been tapped four times. Ten years ago it was stated that a tumor had been detected in the abdomen. There was a good deal of discussion as to the nature of the case, and she was referred to me for a decision as to the advisability of an operation. There was a solid tumor in the lower abdomen, which could be moved from side to side. I suggested the possibility of dropsy dependent upon a solid ovarian tumor, and asked my colleague, Dr. Kelly, to operate. He found a large fibroma of the right ovary with twisted pedicle and adhesions to the omentum. The tumor was removed, and the patient has recovered.

Dr. Hunner, Professor Kelly's first assistant, has very kindly collected for me the cases bearing upon

this point from the gynecological clinic of the Johns Hopkins Hospital. Among 9400 cases there have been 10 patients with solid ovarian tumors, the ages ranging from 32 to 63. In six of these cases ascites was present on admission. Three of the cases had required repeated tapping. All of the cases recovered after operation.

As Dr. Eden remarks, ascites is the rule with solid tumors of the ovary, and so rare with fibroids of the uterus that its presence almost serves to exclude them. Other forms of tumor may be associated with ascites. In Montreal I saw a case of leukemia with recurring ascites. On the occasion of my first visit the distension was so great that the spleen could not be felt; in fact, the diagnosis was not made until after the patient had been tapped. In a case of a solid tumor of the mesentery there was an ascites of moderate degree.

The association is one to which the attention of the profession has not been called sufficiently. I was so impressed with it in the case upon which Dr. Thomas operated, that I made a reference to solid tumors as a cause of recurring ascites in the first edition of my text-book (1892). The question of operation is a very important one; the solid ovarian tumor is usually benign, and, as mentioned, the cases in Dr. Kelly's clinic have uniformly recovered.



ON HEREDITY IN BILATERAL CYSTIC KIDNEY.

BY

WILLIAM OSLER, M.D.,

Professor of Medicine, Johns Hopkins University.

Since reporting the two cases in *American Medicine* of March 22, the following case has come under observation, illustrating the unusual feature of heredity in this condition :

B. E. B., aged 39, Chestnuthill, Mass. He was perfectly well until two years ago, when he had influenza severely. He at that time had hematuria, and three years before, while coasting, he tripped and had a fall. and then had hematuria. Before this he had noticed that he had not been in as good health as usual, and had some fulness of the abdomen, more at times than at others, and had felt a hardness in it. He was under the care of Dr. Baldwin, of Chestnuthill, and he at this time began to fear that he had the same malady of which his mother died. In 1882 Dr. Fitz performed a necropsy on his mother and found bilateral cystic kidneys. This statement is confirmed in a letter from Dr. Fitz, who says that the patient was supposed to have scrofulous glands. She died unconscious in the fiftieth year of her age, probably in a state of uremia.

With the exception of occasional attacks of dyspepsia, the patient had been strong and well, had taken plenty of exercise, had no pain in the back, no lameness. He has been playing golf and has felt very well and vigorous. He had been seen by Dr. Folsom and by Dr. Fitz, both of whom decided that he had bilateral cystic kidneys.

Present Condition.—The patient looks very well, of good color. There is nothing in his appearance to attract attention. There is a little fulness in the upper abdomen. I dictated the following note at the time of examination: Robust, healthy-looking man; weight about 145, stripped; good color; tongue clean. Pupils are of medium size, react well to light and on accommodation. Superficial arteries are sclerotic. Heart: apex beat in fourth and fifth, in and just inside the nipple a little forcible; rather wide area of pulsation; aortic second palpable; soft systolic at apex; ringing, accentuated aortic second.

Abdomen.—Symmetrical; looks a little full in proportion to the chest. The costal border in the nipple line is lifted on both

sides; a little greater fulness below the right costal border. The flanks bulge considerably. Girth of abdomen at navel, 85 cm.; at level of ensiform, 89 cm. From behind slight bulging in both flanks. When he stands up there is a marked prominence of the abdomen, particularly in the flanks. The lower ribs have been spread by the tumors. On palpation both flanks are occupied by large masses. On the left side, the larger, the tumor extends fully three inches below level of navel; not so much to be felt except on deep pressure below the costal border in the nipple line. On bimanual palpation the mass can be lifted up and visibly pressed forward; irregularities can be distinctly felt. The descending colon runs over it, and can be felt as a cord (he himself has noted that it can be moved from side to side). In the right side the mass is not so large. The colon is felt in front of it. There are several distinct nodular prominences; one can feel definite hemispheric irregularities with the greatest ease. Both masses descend with inspiration. The liver is not enlarged; perhaps a little pushed up by the tumor. The thyroid is not enlarged; both lobes are palpable. Both discs are clear.

Urine.—Pale, straw yellow; clear; no precipitate, acid, 1.012; faint trace of albumin; no sugar; no diazo. Microscopically (centrifugalized specimen) no casts to be found; few squamous cells.

The bilateral tumors, the cardiovascular changes, the recurring hematuria and the condition of the urine make the diagnosis quite clear. The unusual feature is the fact that his mother died of the same disease. So far as he knew, no other members of the family had been attacked.

With reference to heredity in this condition Morris notes as follows: "Polycystic kidney has been known to follow a natural labor in a mother of five children; it affected only one of her kidneys. There cannot be said to be more than a slight hereditary tendency to polycystic kidney. The three cases in the same family reported by Bar have been just referred to. A case is recorded in which it affected one kidney of a woman two members of whose family died of post-scarlatinal nephritis, and another child, a daughter, had a polycystic kidney." (Vol. i, p. 656.) In a recent paper by Borelius (*Nordiskt Med. Arkiv*, abstracted in the *Journal of the Amer. Med. Assoc.*, 1902, I), three of the four cases which he described belonged to the same family, father, son and nephew.

Amebic Dysentery.

BY WILLIAM OSLER, M.D.,

Professor of Medicine, Johns Hopkins University.

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AMEBIC DYSENTERY.*

BY WILLIAM OSLER, M.D.

As, with the exception of the studies of Kartulis, the most important work on the subject of amebic dysentery has come from the Johns Hopkins Hospital, we have naturally followed the recent investigation on dysentery with great interest. I cannot here go into historical details, but the work in this country dates from March, 1890, when I found amebæ in the liver abscess of a young doctor from Panama. Ever since the question of the relationship of the amebæ to dysentery has been one of constant study. In quick succession a series of cases occurred in my wards, and were made the subject of study by Councilman and Lafleur, whose monograph has done much to make this form of the disease widely known.

I do not propose in this discussion to speak of the pathology of the disease or of the characters of the amebæ. What I wish to make is a brief statement as to the colitis, with which in Baltimore we have found the amebæ associated.

A sporadic affection, it has not occurred in wide-spread epidemics, either throughout the city or State, so far as I

*Remarks at a discussion on dysentery at the Philadelphia County Medical Society, Philadelphia, March 26.

know, or in institutions. A very limited number of cases have been admitted to the wards, only ninety-three to date. In a few instances three, four, and five cases have come from the same locality, or three and four members of the same family have been attacked. It has involved chiefly males; only eleven females in our group. It is more common among whites than among the colored; there were only nine colored patients. It is a disease of adults; more than fifty per cent of the cases were in the third and fourth decades.

While the disease may run an acute course and may prove fatal within a few weeks, in a very large proportion of the cases it is chronic, characterized by slight fever and frequent movements, containing mucus, blood, pus, and amebæ. Many cases are from the very outset subacute; a majority of them become chronic, so that the disease drags on for many months or years, with alternating periods of constipation and diarrhea. Very few cases die of the dysentery *per se*; of the ninety-three patients in my wards, only two died of the asthenia induced by the dysentery itself. Two died of perforation.

By far the most important and serious feature of the type of colitis with which the amebæ are associated is the liability to abscess of the liver. Of the ninety-three cases referred to, twenty-three had abscess of the liver. This large percentage is due to the fact that only the more severe cases come to hospital. In Strong's sev-

enty-nine post-mortems on cases of amebic dysentery there were fourteen instances of liver abscess.

While at first, after the work of Shiga and Flexner, there was a feeling that possibly all the forms of dysentery might be due to the bacilli, gradually those who have had the most favorable opportunities for studying the diseases have come to the conclusion that the amebic form of dysentery has well marked and characteristic differences. As Dr. Strong has pointed out in his admirable studies in Manila, where the two forms occur together, the cases can be recognized from each other and readily differentiated. In the first place the amebic variety does not seem to occur in such wide-spread epidemics. Secondly, it rarely has the very acute course, and it kills much more frequently by its complications than by the actual colitis. The chronicity and the liability to recurrence give it a very peculiar stamp. Thirdly, characteristic amebæ are found in the stools or in the liver abscess which may have followed a protracted case. Lastly, and this is a very important point in the differentiation, the serum reaction with Shiga's bacillus is absent in the amebic form. Upon this point we can speak very positively. Since the return of Dr. Flexner from the Philippines there have been some fifteen or sixteen cases of amebic dysentery in my wards, in none of which has the serum reaction, so characteristic of the bacillary form, been present.

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NOTES ON ANEURISM



WILLIAM OSLER, M.D.
Baltimore, Md.

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NOTES ON ANEURISM.

WILLIAM OSLER, M.D.

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY.

BALTIMORE. MD.

SUMMARY.

1. Arteriovenous Aneurism of the Subclavian Vessels.
2. The Humming-top Murmur in Thoracic Aneurism.
3. On the Value of the Fluoroscope in the Diagnosis of Obscure Cases of Thoracic Aneurism.
4. On the Importance of Careful Inspection of the Chest in Thoracic Aneurism.

1. ARTERIOVENOUS ANEURISM OF THE SUBCLAVIAN VESSELS.

The elaborate study by Matas, published in the early numbers of *THE JOURNAL* this year, and his analysis of the 15 cases on record, add interest to the following report:

CASE 1.—CLINICAL SUMMARY. *Bullet-wound of the right subclavian artery and vein in January, 1900. Formation of arteriovenous aneurism. Operation not advised. Good health March, 1902.*

Edward S., aged 29, of Kentucky, was sent to me by Dr. Alderson on April 9, 1900, with the following history: On the night of Jan. 5, 1900, he was shot, receiving four bullets. One entered the left shoulder and is now imbedded in the upper portion of the spine of the scapula and gives no trouble. One entered about the middle of the back of the left arm and passed inwards and downwards to inside the condyle of the humerus, where it was deflected across the bend of the elbow and down the forearm, making its exit about the upper third, injuring the ulnar nerve. The third bullet entered the left side a little behind the mid-axillary line between the ninth and tenth ribs. It apparently did not penetrate the chest at all. The fourth entered just about the middle of the fold of the left trapezius, passed inwards and downwards in front of

the spine and came out under the right clavicle. The wounds healed rapidly. He had at first some difficulty in swallowing, but he has gradually been getting well. There was at once considerable swelling in the neighborhood of the clavicle, with marked pulsation, a thrill and a bruit.

Present Condition.—He looks well. Tongue is clean. Chest is well formed. Immediately above the free margin of the middle of the left trapezius there is a bullet-wound, the point of entrance of the ball which caused the aneurism. The left clavicle stands out a little more prominently than the right. The right clavicle is just visible. The supraclavicular fossa is occupied by a pulsating swelling which causes a marked prominence between the sterno-clavicular margin, extending outward a distance of about 7 cm. It does not lift the sterno-cleido-mastoid muscle, the sternal outline of which is plainly marked. The sternal notch is plainly marked. Above, the swelling extends for fully 7 cm. The pulsation is visible over the whole tumor. From behind it is very noticeable. On palpation there is a marked thrill, continuous, but with systolic intensification, felt and heard over the whole tumor, and felt up the neck fully 7 cm. from the clavicle. It is well felt on deep pressure to the right in the sternal notch, not felt on the clavicle. The tumor forms a distinct pulsating mass about the size of, or a little larger than, an egg, quite painless. No thrill is felt below the clavicle or over the body of the heart or on the sternum. Apex beat in nipple line; no increase in area of cardiac flatness. On auscultation both sounds are loud and clear at apex and over the whole precordia. Everywhere, too, from the apex up, increasing in intensity, is heard a humming-top murmur, with marked systolic intensification. At the sternum it is very loud, and over the aneurism reaches its maximum intensity. An interesting feature is that he feels the pulsation in the left ear, not in the right. The murmur is of extraordinary intensity, heard up and down the neck, heard along the axillary artery to the elbow. The systolic murmur is very intense, and the whole diastole is occupied by a wheezing, wiry *Æolean* murmur. In the recumbent posture the tumor does not look larger, and the thrill is not so evident. The pulsation in the subclavian below the clavicle on the left side is visible. On the right side it is not visible. There is a marked difference between the pulse in the radial arteries; the right is feeble, only just to be felt. The brachial pulse can be felt. The axillary can be felt, much feebler on the right side than on the left. The carotid on the right side is full and easily felt. There is no thrill in it on palpation. There is no difference in the pulse in the temporal arteries. The bullet was located with the *x*-rays, and can be felt just below the clavicle.

There is no question that the bullet in this case has nicked the subclavian artery and vein, causing arteriovenous aneurism. The man's general condition was good, and as he was improving I counseled very strongly non-interference. Subsequently he saw several surgeons, some of whom were anxious to operate, but fortunately he escaped them. Since then he has been doing well, and I heard from his physician, March, 1902, that the tumor is smaller and he is able to do quiet work and has little or no inconvenience.

The question of operation in these cases has been very fully discussed by Matas in his exhaustive study above referred to. Of his collection of 15 cases 4 were operated on, 3 within 12 days of the injury, and one 32 years after, which was the only one fatal. Unfortunately, 6 of the 11 cases passed out of observation within a few weeks or months after the injury, while the lesion was still active. The ultimate result of the other cases shows that the condition may remain quiescent for a long period of years. In a few instances there were serious disturbances of the circulation and innervation of the hand and arm, while in one case (Watmann's), after a latent period of thirty-one years, the lesion became active and gave rise to fatal complications.

The condition of arteriovenous aneurism has interested me for a number of years, having had under observation at intervals a man whose case I described in the *Annals of Surgery*, 1893. At that time he was twenty-five years of age. When fifteen he had fallen and a lead-pencil in his waistcoat pocket penetrated the axilla, causing an arteriovenous aneurism. He had remained very well, had been very active and strong, had rowed in boat races. I heard of this patient not many months ago. He had served through the South African war, so that his general condition must have remained good. The aneurism has persisted now for more than twenty-three years.

Arteriovenous aneurism is so rare a lesion that even surgeons of large experience are often a little perplexed as to the best course to follow. I am very much impressed with this in the extraordinary differences of opinion given to the young man with the lesion high up in the axillary artery. The conclusions of Matas which are strongly in favor of non-interference may be quoted:

"The statistics which we furnish in this paper—the most complete list of the reported instances of this rare lesion which has thus far appeared—tend to confirm the arguments of the 'let-well-enough-alone' policy, in so far as they demonstrate that in at least 11 of the 15 cases the patient survived the immediate effects of the injury and of the arteriovenous aneurism that followed it for variable and often long periods of time."

2. THE HUMMING-TOP MURMUR IN THORACIC ANEURISM.

In September, 1888, there was admitted under Dr. Pepper's care at the University Hospital, Philadelphia, a Chinaman, whose case I had frequent opportunities to study with Dr. Crozier Griffith. The case was reported by Pepper and Griffith in the "Transactions of the Association of American Physicians," Vol. V. The remarkable features were cyanosis, and a murmur of extraordinary character, heard loudest at the aortic cartilage and accompanied with a thrill. As described by the writers, the murmur was "loudest and highest pitched with the cardiac systole; it died away very considerably during the diastole, and lowered its pitch by several tones, to rise again both in volume and pitch with the next systole. It was thus continuous, and had a distinctly venous quality, although unlike a venous hum in that it was distinctly rhythmic." At the autopsy there was found a small aneurism of the ascending aorta which communicated with the superior vena cava by an opening three-fourths of an inch in length. The case made a very definite impression upon me, and I have since learned to recognize the murmur as almost pathognomonic of abnormal communication between the chambers of the heart or between the great vessels at the root of the neck, or of an aneurism at the aorta with the vena cava or pulmonary artery. More definitely, the cases in which I have recognized it have been congenital heart disease with persistence of the ductus arteriosus, cases of imperfection of the ventricular septum, and in the two cases here given:

CASE 2.—CLINICAL SUMMARY. *Young man. Syphilis 3 years before admission. Cough. Shortness of breath. Aneurismal tumor to right of sternum. Loud, continuous murmur with systolic intensification. Postmortem. Communication of a large branch of the right pulmonary artery with the aneurismal sac.*

Joseph M., aged 30, admitted first on July 29, 1901 (Med.

No. 13,212), complaining of shortness of breath, cough and pain in the chest. An important point in his history was that three years ago he had syphilis. He had been a heavy drinker and a heavy smoker. His illness began in October, 1900, with a cough, which was dry and hard and troubled him very much at night. He had shortness of breath from the beginning. These symptoms increased throughout the winter. He had pain first in February.

On his first admission the signs of aneurism of the thoracic aorta were very well marked—a visible bulging with pulsation to the right of the sternum; no thrill; very exaggerated diastolic shock; flatness over the pulsating area. Dr. Futcher, who dictated the note, described the heart sounds as clear and a very faint soft systolic murmur along the left sternal border and over the prominent part of the pulsation. There was no diastolic murmur. The patient was given a gelatin injection and kept at rest. On my return in September I saw him, and he then had very much the symptoms described by Dr. Futcher when first admitted.

Then he returned on December 31. He had been in the country and had become very much worse, having attacks of dyspnea and weak spells. The pulsating tumor was larger. There was a wider extent of flatness. The most remarkable change was on auscultation over the sac. The diastolic shock was extreme and there was a feeble thrill. There was a very loud, continuous murmur occupying the entire cardiac cycle, with a great deal of echoing reverberation and marked systolic intensification.

The sac was evidently so large and so far out that, while I recognized the murmur as the kind heard with abnormal communication, I must say I thought it possible that this remarkable whirring, continuous murmur might be produced in a very large sac.

The patient died Jan. 10, 1902. The anatomic diagnosis was arteriosclerosis, aneurism of the arch of the aorta, compression and atelectasis of right lung. On the posterior wall of the sac, where it had pressed into the lung, one of the main branches of the right pulmonary artery, fully as large as the little finger, opened directly into the sac.

CASE 3.—CLINICAL SUMMARY. *Syphilis two years before observation. Cyanosis. Shortness of breath. Great congestion of the veins of the upper-half of the body and of the arms. Gradual development of compensatory circulation in the mammary and epigastric veins. Over the manubrium and aortic regions a continuous murmur with marked systolic intensification, limited to the area about the aortic cartilage and the middle of the manubrium. Death. No Autopsy.*

Jos. S., aged 39, an iron-molder, applied at the dispensary of the Johns Hopkins Hospital Dec. 7, 1889. He had been ill

since January, complaining of giddiness, cough, shortness of breath, swelling of the feet and a congested and bluish condition of the face, which became aggravated when he attempted to do heavy work. He is a thick-set, well-built, muscular man. He had a chancre two years ago. There is no history of rheumatism or chorea, but in September, 1888, he was in bed three weeks with some obscure pulmonary trouble.

Physical Examination. Face is swollen and reddish; lips and ears are cyanotic. Conjunctivæ watery. The tongue is clean, deeply congested and the whole of the pharyngeal mucosa is intensely engorged. Chest is large, antero-posterior in diameter, deep. The skin, covering the entire thorax and of the arms is congested. The venules along the line of the diaphragm and in the lateral region of the chest are dilated. The neck is thick, supra-clavicular spaces distended, sternal notch obliterated. The breathing is quiet, 24 to the minute. The apex beat is indistinct, but a feeble impulse is visible in 5th in nipple line and there is throbbing in the epigastric notch. There is a feeble shock of the first to be felt at the apex, but there is no pulsation at the base on deep pressure. There is no dulness on the manubrium sterni and the superficial area of heart dulness is not increased. On auscultation there is a systolic murmur at apex, propagated to the back. The second sound is ringing. Along the left sternal border the systolic murmur becomes more intense. Over the manubrium there is a loud murmur of very peculiar character, not like an ordinary aortic systolic, short and rough, but a murmur which seems continuous and during the systole greatly intensified. The second sound at the base is clear and ringing. The radial pulses are equal; pupils equal. There is no brassy cough. On examination of the chest a few piping râles with prolonged expiration were noted.

The patient was seen on four occasions during the next month. The cyanosis and shortness of breath had increased. On January 7 I made the following note: Much worse since last seen on the 2d. The face is much swollen and absolutely blue, looking like that of a man who had been strangled. The mucous membrane of the pharynx intensely livid. Eyelids swollen; conjunctivæ deeply engorged. The neck is enlarged; the external jugular is prominent. The upper part of the chest and both arms are swollen but not edematous. The veins of the arms are full. The whole subcutaneous tissue feels thickened and infiltrated. The right side and the right arm are more swollen than the left. In the lower chest zone the venules are greatly enlarged, but no large mammary veins are visible. When stripped the contrast between the upper and the lower parts of the body is remarkable. The engorgement goes as far as the lower abdominal zone. The legs are quite pale.

The amount of subcutaneous infiltration is such that the superficial veins are not visible. The apex beat is indistinct. There is a systolic shock. The area of cardiac dulness is not increased. In 5th interspace below nipple, there is a loud systolic murmur not obliterating the first sound, at aortic cartilage and on manubrium the same remarkably loud, continuous murmur is heard, with systolic intensification; second sound clear and ringing. The systolic murmur is heard to left and right two inches from the sternum, but the continuous murmur is only heard at the more limited area about the aortic cartilage with a maximum at mid-manubrium.

The radial pulses were equal, 98; respiration quiet. The subjective sensations of the patient are remarkable. He says that he feels comfortable with the exception of the feeling of distension in face, chest and arms. It is extraordinary how slight is the distress in breathing in a man presenting a condition of such extreme cyanosis. He says that one of his chief annoyances is the shock which his appearance gives to his friends. He is not drowsy. His intellectual condition is perfect. He sleeps at night with his head high.

About two weeks subsequent to this visit we heard that the patient had died; but his wife refused an autopsy. She said he got progressively worse and even more cyanotic. He was taken to the city hospital, but whether he died there or at his house she did not say.

This patient presented the characteristic features which Pepper and Griffith describe in an analysis of some 29 cases of communication between an aneurism of the aorta and the superior vena cava, more particularly the extreme cyanosis of the face and upper parts of the body, with evidences of obstruction of the circulation in the tributaries of the superior vena cava. They regard the murmur as characteristic of communication between an artery and a vein, and state that it was first described by Thurman in 1832-33. The characters are:

1. It is continuous, occupying both the systole and diastole.

2. There is a systolic reinforcement, often of great intensity.

3. The venous quality of the murmur, resembling the characteristic venous hum in the jugular and the murmur over the thyroid in Graves' disease.

The quality varies. It may be a buzzing or it may have a remarkable, sonorous, vibratory character, or, again, it may be a churning or purring murmur. Ord describes

it very well as a long continuous humming murmur, never ceasing, but varying in intensity, more sonorous during systole, fainter during diastole. To Thurman the credit appears to be due for the recognition of a murmur of this quality as pathognomonic of arterio-venous aneurism. The question has been very fully discussed by Sir William Gairdner in the Glasgow Hospital Reports, 1899, in the report of an interesting case in which a small aneurism of the ascending portion of the arch communicated with the pulmonary artery.

3. ON THE VALUE OF THE FLUOROSCOPE IN THE DIAGNOSIS OF OBSCURE CASES OF THORACIC ANEURISM.

CASE 3.—CLINICAL SUMMARY. *Cough and dyspnea for six months. Much emaciation. Flatness to left of sternum. Diagnosis of mediastinal sarcoma. Examination by fluoroscope showed a characteristic pulsating tumor. Subsequent slight pulsation of the thoracic wall. Wiring of the sac. Hemoptysis. Death.*

On Jan. 15, 1902, I was consulted by Mr. T. R. F., who had been complaining of cough for six months, loss in weight and pains through the chest. I was impressed at once with the expression of great distress and anxiety in the poor fellow's face. He looked worn and exhausted with suffering, and he said that he had not been able to lie down for some weeks, and had had nights of indescribable anguish owing to the orthopnea, pain and sense of smothering. I was impressed at once with the noisy, stridulous, tracheal character of the breathing. He had been a bartender, had taken alcohol freely, and had had venereal sores at different times; the strong probability is that he has had syphilis. He thinks that for a year he has had some cough, but for six months there have been shortness of breath, loss of weight and pain in the chest. About three months ago his voice changed. He has had no spitting of blood. Of late he has had frightful paroxysms of pain and orthopnea, particularly at night. He had consulted a number of physicians in New York and elsewhere, and the diagnosis had been made of mediastinal sarcoma.

On examination the chest was well-formed, expansion good and seemed equal on both sides. No abnormal area of pulsation was noticeable; no throbbing in the sternal notch. There was an area of impaired resonance in the first, second and third left interspaces and over the central portion of the manubrium. The point of maximum impulse was in the fifth interspace, $10\frac{1}{2}$ cm. from the mid-sternal line. The cardiac flatness was not increased. There was a soft systolic murmur at the apex; the second sound was clear and without special

accentuation over the area of dullness. The pulse was of good volume; the left radial was smaller than the right. The breath sounds on the left side were less intense than on the right.

Altogether, at the first examination I was inclined to agree with the diagnosis which had already been made of mediastinal sarcoma. It seemed to me that an aneurism would by this time have shown more definite physical signs. The patient entered the Johns Hopkins Hospital that I might study his case more fully. The following additional points were then made out. First, "with the *x*-rays there was a large shadow seen, which extended from the upper end of the sternum to the upper border of the third rib. It did not extend to the right beyond the shadow of the vertebræ, but did to the left to about opposite a point $\frac{2}{5}$ of the extent of the clavicle from the inner end. It was sharply defined with clear outlines, showed slight pulsation and moved very slightly to the left on deep inspiration. It could be clearly separated from the shadow of the heart. Looked at from behind it looked larger than from in front. It is worthy of note that it seemed denser and with much sharper outlines than in cases of undoubted aneurism previously examined." (Dr. McCrae.) Secondly, on the second day after admission, on getting the patient into a bright light and examining the chest critically, there was seen a distinct slight visible pulsation in the first left interspace and the left clavicle was slightly lifted. Thirdly, there was well-marked paralysis of the left vocal cord. Fourthly, the blood pressure showed the right brachial maximum 118, left brachial maximum 103. These points seemed quite sufficient to settle the diagnosis of aneurism against that of mediastinal sarcoma. It is interesting to note that there was no bruit over the pulsation; no special accentuation of the aortic second sound. The patient's condition was most distressing. The nights were passed in terrible distress and in order to reduce the blood pressure he was bled on several occasions with very great relief. On January 20 his condition seemed perfectly desperate, and as a last resort I asked Dr. Finney to wire the sac. The patient stood the operation remarkably well. The needle was inserted in the second left interspace about 5 cm. from the sternal margin over an area in which there was marked pulsation. "A medium-sized needle was inserted in a direction backward and slightly downward and inward. When the needle had been inserted about 6 cm. a pulsation was transmitted to it. It was then pushed in about 2 cm. further, when fresh blood escaped in spurts. Ten feet and seven inches of No. 27 spring silver wire, wound large, (75 parts copper to 1000 silver, alloy) was then slowly inserted. A current of 10

ma. was then allowed to pass through the wire for one hour." The patient seemed very much benefited by the operation, and seemed for a few days decidedly improved. Then, on the night of the 17th he had a small hemorrhage. On the 18th he had a sudden profuse hemorrhage from the lungs and died in a few moments. The heart beat faintly for thirty seconds after the last respiration.

Postmortem there was found an aneurism of the transverse arch, containing mural thrombi within the sac, and the wire was within the sac. There was compression of the left bronchus, perforation into the trachea, hemorrhage into the right lung.

It is particularly in this group of aneurisms, with symptoms and no physical signs, that the *x*-ray examination is of such service, but we have not had a case in which it was more clearly demonstrated than in the one here noted.

1. ON THE VALUE OF CAREFUL INSPECTION OF THE CHEST IN THE DIAGNOSIS OF THORACIC ANEURISM.

A bare chest, a good light and good eyes are the essentials. Routine in the examination is important. Invariably at the ward visit after the inspection of the front of patient's chest I say to the student, "What next?" and he immediately proceeds to palpation, overlooking the inspection of the back, and which, if not made in the right time, and in a routine manner, may be overlooked altogether.

Many years ago at the Girard Hotel, Philadelphia, I saw a remarkable case which illustrated the value and importance of the point. The patient had a large area of pulsation in the lower front of the chest, extending almost from one nipple to the other, with distinct prominence. There was a double murmur at the base of the heart, and the case had been regarded as one of aortic insufficiency, which condition was present. He had paroxysms of great distress and orthopnea, and there were peculiar features about the case, so that one or two of the leading physicians in Philadelphia had expressed themselves as somewhat puzzled about its nature. Fortunately, after finishing the inspection in front, I turned the patient's back to a good light, and the diagnosis was made at a glance. There was a pulsating aneurismal tumor in the left interscapular region, which had given him no pain whatever, and which had not attracted the attention of his physicians. A remarkable condition

was present in this case, which I had never seen before; namely, a complete absence of the pulse in the iliacs and femorals.

At present in my wards are two cases illustrating this very well; a man (Leonard) has a wide area of impulse in the lower sternum and adjacent interspaces. He has been under observation now for nearly three years, and time and again Dr. Thayer, Dr. Fitcher and myself have discussed the possibilities. A positive diagnosis was not reached until a year ago, when a slight pulsation was seen in the left interscapular region, which has increased, and it is now quite evident that there is a large aneurism of the descending thoracic aorta.

The second case, a man aged about 35, has on inspection of the chest a very well-marked pulsation of the manubrium. The diagnosis of aneurism will be made at a glance. He has had a great deal of dyspnea and pain in the chest. On additional examination it is noted as rather remarkable that with so much pulsation on the manubrium there is little or no flatness. There is a well-marked to-and-fro friction. Inspection of the back shows in the left interscapular region slight bulging, with well-marked visible and palpable pulsation.

Sometimes the diagnosis is hidden beneath a tucked-up undershirt. Last year a robust-looking man consulted me about Nauheim: he had been told that he had heart disease, and a physician in Florida had said that his case was a very suitable one for the Schott baths. When stripped, the diagnosis was made at a glance. The head of the clavicle was lifted out of its bed with each systole, and there was a definite pulsating tumor above the sternal notch with a thrill and a loud to-and-fro murmur. In the numerous examinations he had never taken off his shirt, but had tucked it up, and consequently, nobody had ever noticed the aneurism.

Some years ago I got into trouble by too careful inspection and detecting an early throbbing in the third right interspace. A robust, strong man consulted me for cough, shortness of breath and inability to lie down at night. He had the wheezing, goose-cough, as it is called, and there was to be seen most clearly and distinctly, a pulsation to the right of the sternum. With rest, the symptoms improved and the pulsation lessened remarkably. Other physicians (among them one well-

recognized authority on heart disease) assured the family there must have been a mistake, as there were no signs of aneurism. The patient improved and I saw him about for more than two years. I began to think that there had been a mistake, but subsequent events showed that the diagnosis was correct. Spontaneously, particularly after prolonged rest, the pulsation of an aneurism to the right or left of the sternum may completely disappear. I do not refer here to cases of 20 called dynamic pulsation, but to cases in which the subsequent history and autopsy has confirmed the existence of an aneurism.

WILLIAM BEAUMONT

A Pioneer American Physiologist



William Osler, M.D.
Baltimore

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BALTIMORE.

Come with me for a few moments on a lovely June day in 1822, to what were then far-off northern wilds, to the Island of Michilimacinac, where the waters of Lake Michigan and Lake Huron unite and where stands Fort Mackinac, rich in the memories of Indian and voyageur, one of the four important posts on the upper lakes in the days when the rose and the fleur-de-lys strove for the mastery of the western world. Here the noble Marquette labored for his Lord, and here beneath the chapel of St. Ignace they laid his bones to rest. Here the intrepid LaSalle, the brave Tonty and the resolute Du Luht had halted in their wild wanderings. Its palisades and block-houses had echoed the war-whoops of Ojibwas and Ottawas, of Hurons and Iroquois, and the old fort had been the scene of bloody massacres and hard-fought fights, but at the conclusion of the War of 1812, after two centuries of struggle, peace settled at last on the island. The fort was occupied by United States troops, who kept the Indians in check and did general police duty on the frontier, and the place had become a rendezvous for Indians and voyageurs in the employ of the American Fur Company. On this bright spring morning the village presented an animated scene. The annual return tide to the trading

* An Address before the St. Louis Medical Society, Oct. 4, 1902.

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HDR

post was in full course, and the beach was thronged with canoes and batteaux laden with the pelts of the winter's hunt. Voyageurs and Indians, men, women and children, with here and there a few soldiers, made up a motley crowd. Suddenly from the company's store there is a loud report of a gun, and amid the confusion and excitement the rumor spreads of an accident, and there is a hurrying of messengers to the barracks for a doctor. In a few minutes (Beaumont says twenty-five or thirty, an eye-witness says three) an alert-looking man in the uniform of a U. S. Army surgeon made his way through the crowd and was at the side of a young French Canadian who had been wounded by the discharge of a gun, and with a composure bred of an exceptional experience of such injuries, prepared to make the examination. Though youthful in appearance, Surgeon Beaumont had seen much service, and at the capture of York and at the investment of Plattsburgh he had shown a coolness and bravery under fire which had won high praise from his superior officers. The man and the opportunity had met—the outcome is my story of this evening.

I. THE OPPORTUNITY—ALEXIS ST. MARTIN.

On the morning of June 6 a young French Canadian, Alexis St. Martin, was standing in the company's store, "where one of the party was holding a shotgun (not a musket), which was accidentally discharged, the whole charge entering St. Martin's body. The muzzle was not over three feet from him—I think not more than two. The wadding entered, as well as pieces of his clothing; his shirt took fire; he fell, as we supposed, dead."

"Doctor Beaumont, the surgeon of the fort, was immediately sent for and reached the wounded man in a very short time, probably three minutes. We had just gotten him on a cot and were taking off some of his clothing. After the doctor had extracted part of the shot, together with pieces of clothing, and dressed his wound carefully, Robert Stuart and others assisting, he left him, remarking: 'The man can not live thirty-six hours; I will

come and see him by and by.' In two or three hours he visited him again, expressing surprise at finding him doing better than he had anticipated. The next day, after getting out more shot and clothing and cutting off ragged edges of the wound, he informed Mr. Stuart, in my presence, that he thought he would recover."*

The description of the wound has been so often quoted as reported in Beaumont's work that I give here the interesting summary which I find in a "Memorial" presented to the Senate and House of Representatives by Beaumont. "The wound was received just under the left breast, and supposed, at the time, to have been mortal. A large portion of the side was blown off, the ribs fractured and openings made into the cavities of the chest and abdomen, through which protruded portions of the lungs and stomach, much lacerated and burnt, exhibiting altogether an appalling and hopeless case. The diaphragm was lacerated and a perforation made directly into the cavity of the stomach, through which food was escaping at the time your memorialist was called to his relief. His life was at first wholly despaired of, but he very unexpectedly survived the immediate effects of the wound, and necessarily continued a long time under the constant professional care and treatment of your memorialist, and, by the blessing of God, finally recovered his health and strength.

"At the end of about ten months the wound was partially healed, but he was still an object altogether miserable and helpless. In this situation he was declared 'a common pauper' by the civil authorities of the county, and it was resolved by them that they were not able, nor required, to provide for or support, and finally declined taking care of him, and, in pursuance of what they probably believed to be their public duty, authorized by

* Statement of G. G. Hubbard, an officer of the company, who was present when St. Martin was shot, quoted by Dr. J. R. Bally, of Mackinac Island, in his address on the occasion of the Beaumont Memorial Exercises, Mackinac Island, July 10, 1900. *The Physician and Surgeon*, December, 1900.

the laws of the territory, were about to transport him, in this condition, to the place of his nativity in lower Canada, a distance of more than fifteen hundred miles.

“Believing the life of St. Martin must inevitably be sacrificed if such attempt to remove him should be carried into execution at that time, your memorialist, after earnest, repeated, but unavailing, remonstrances against such a course of proceedings, resolved, as the only way to rescue St. Martin from impending misery and death, to arrest the process or transportation and prevent the consequent suffering, by taking him into his own private family, where all the care and attention were bestowed that his condition required.

“St. Martin was, at this time, as before intimated, altogether helpless and suffering under the debilitating effects of his wounds—naked and destitute of everything. In this situation your memorialist received, kept, nursed, medically and surgically treated and sustained him, at much inconvenience and expense, for nearly two years, dressing his wounds daily, and for considerable part of the time twice a day, nursed him, fed him, clothed him, lodged him and furnished him with such necessaries and comforts as his condition and suffering required.

“At the end of these two years he had become able to walk and help himself a little, though unable to provide for his own necessities. In this situation your memorialist retained St. Martin in his family for the special purpose of making physiological experiments.”

In the month of May, 1825, Beaumont began the experiments. In June he was ordered to Fort Niagara, where, taking the man with him, he continued the experiments until August. He then took him to Burlington and to Plattsburgh. From the latter place St. Martin returned to Canada, without obtaining Dr. Beaumont's consent. He remained in Canada four years, worked as a voyageur, married and had two children. In 1829 Beaumont succeeded in getting track of St. Martin, and the American Fur Company engaged him

and transported him to Fort Crawford on the upper Mississippi. The side and wound were in the same condition as in 1825. Experiments were continued uninterruptedly until March, 1831, when circumstances made it expedient that he should return with his family to lower Canada. The "circumstances," as we gather from letters, were the discontent and homesickness of his wife. As illustrating the mode of travel, Beaumont states that St. Martin took his family in an open canoe "via the Mississippi, passing by St. Louis, ascended the Ohio river, then crossed the state of Ohio to the lakes, and descended the Erie and Ontario and the river St. Lawrence to Montreal, where they arrived in June." Dr. Beaumont often lays stress on the physical vigor of St. Martin as showing how completely he had recovered from the wound. In November, 1832, he again engaged himself to submit to another series of experiments in Plattsburgh and Washington. The last recorded experiment is in November, 1833.

Among the Beaumont papers, for an examination of which I am much indebted to his daughter, Mrs. Kein (Appendix A), there is a large mass of correspondence relating to St. Martin, extending from 1827, two years after he had left the doctor's employ, to October, 1852. Alexis was in Dr Beaumont's employ in the periods already specified. In 1833 he was enrolled in the United States Army at Washington as Sergeant Alexis St. Martin, of a detachment of orderlies stationed at the War Department. He was then 28 years of age, and was five feet five inches in height.

Among the papers there are two articles of agreement, both signed by the contracting parties, one dated Oct. 19, 1833, and the other November 7 of the same year. In the former he bound himself for a term of one year to "serve, abide and continue with the said William Beaumont, wherever he shall go or travel or reside in any part of the world his covenant servant and diligently and faithfully, etc., . . . that he, the said

Alexis, will at all times during said term when thereto directed or required by said William, submit to assist and promote by all means in his power such philosophical or medical experiments as the said William shall direct or cause to be made on or in the stomach of him, the said Alexis, either through and by means of the aperture or opening thereto in the side of him, the said Alexis, or otherwise, and will obey, suffer and comply with all reasonable and proper orders of or experiments of the said William in relation thereto and in relation to the exhibiting and showing of his said stomach and the powers and properties thereto and of the appurtenances and the powers, properties and situation and state of the contents thereof." The agreement was that he should be paid his board and lodging and \$150 for the year. In the other agreement it is for two years and the remuneration \$400. He was paid a certain amount of the money down.

There are some letters from Alexis himself, all written for him and signed with his mark. In June, 1834, he writes that his wife was not willing to let him go and thinks that he can do a great deal better to stay at home. From this time on Alexis was never again in Dr. Beaumont's employ.

There is a most interesting and protracted correspondence in the years 1836, 1837, 1838, 1839, 1840, 1842, 1846, 1851 and 1852, all relating to attempts to induce Alexis to come to St. Louis. For the greater part of this time he was in Berthier, in the district of Montreal, and the correspondence was chiefly conducted with a Mr. William Morrison, who had been in the northwest fur trade and who took the greatest interest in Alexis and tried to induce him to go to St. Louis. (See Appendix B.)

In 1846 Beaumont sent his son Israel for Alexis, and in a letter dated Aug. 9, 1846, his son writes from Troy: "I have just returned from Montreal, but without Alexis. Upon arriving at Berthier I found that he

owned and lived on a farm about fifteen miles southwest of the village." Nothing would induce him to go.

The correspondence with Mr. Morrison in 1851 and 1852 is most voluminous, and Dr. Beaumont offered Alexis \$500 for the year, with comfortable support for his family. He agreed at one time to go, but it was too late in the winter and he could not get away.

The last letter of the series is dated Oct. 15, 1852, and is from Dr. Beaumont to Alexis, whom he addresses as *Mon Ami*. Two sentences in this are worth quoting: "Without reference to past efforts and disappointments—or expectation of ever obtaining your services again for the purpose of experiments, etc., upon the proposals and conditions heretofore made and suggested, I now proffer to you in faith and sincerity, new, and I hope satisfactory, terms and conditions to ensure your prompt and faithful compliance with my most fervent desire to have you again with me—not only for my own individual gratification, and the benefits of medical science, but also for your own and family's present good and future welfare." He concludes with, "I can say no more, Alexis—you know what I *have* done for you many years since—what I have been *trying*, and am still anxious and wishing to do with and for you—what efforts, anxieties, anticipations and disappointments I have suffered from your non-fulfilment of my expectations. Don't disappoint me more nor forfeit the bounties and blessings reserved for you."

So much interest was excited by the report of the experiments that it was suggested to Beaumont that he should take Alexis to Europe and submit him there to a more extended series of observations by skilled physiologists. Writing June 10, 1833, he says: "I shall engage him for five or six years if he will agree, of which I expect there is no doubt. He has always been pleased with the idea of going to France. I feel much gratified at the expression of Mr. Livingston's desire that we should visit Paris, and shall duly consider the interest

he takes in the subject and make the best arrangements I can to meet his views and yours." Mr. Livingston, the American minister, wrote from Paris March 18, 1834, saying that he had submitted the work to Orfila and the Academy of Sciences, which had appointed a committee to determine if additional experiments were necessary and whether it was advisable to send to America for Alexis. Nothing, I believe, ever came of this, nor, so far as I can find, did Alexis visit Paris. Other attempts were made to secure him for purposes of study. In 1840 a student of Dr. Beaumont's, George Johnson, then at the University of Pennsylvania, wrote saying that Dr. Jackson had told him of efforts made to get Alexis to London, and Dr. Gibson informed him that the Medical Society of London had raised £300 or £400 to induce St. Martin to come, and that he, Dr. Gibson, had been trying to find St. Martin for his London friends. There are letters in the same year from Dr. R. D. Thomson of London to Professor Silliman urging him to arrange that Dr. Beaumont and Alexis should visit London. In 1856 St. Martin was under the observation of Dr. Francis Gurney Smith, in Philadelphia, who reported a brief series of experiments, so far as I know the only other report made on him.*

St. Martin had to stand a good deal of chaffing about the hole in his side. His comrades called him "the man with a lid on his stomach." In his memorial address Mr. C. S. Osborn of Sault Ste. Marie states that Miss Catherwood tells a story of Etienne St. Martin fighting with Charlie Charette because Charlie ridiculed his brother. Etienne stabbed him severely and swore that he would kill the whole brigade if they did not stop deriding his brother's stomach.

At one time St. Martin traveled about exhibiting the wound to physicians, medical students and before medical societies. In a copy of Beaumont's work, formerly

* Medical Examiner, 1856, and Experiments on Digestion, Phila., 1856.

belonging to Austin Flint, Jr., and now in the possession of a physician of St. Louis, there is a photograph of Alexis sent to Dr. Flint. There are statements made that he went to Europe, but of such a visit I can find no record.

My interest in St. Martin was of quite the general character of a teacher of physiology, who every session referred to his remarkable wound and showed Beaumont's book with the illustration. In the spring of 1880, while still a resident of Montreal, I saw a notice in the newspapers of his death at St. Thomas. I immediately wrote to a physician and to the parish priest, urging them to secure me the privilege of an autopsy and offering to pay a fair sum for the stomach, which I agreed to place in the Army Medical Museum in Washington, but without avail. Subsequently, through the kindness of the Hon. Mr. Justice Baby, I obtained the following details of St. Martin's later life, and the picture here given, which was taken the year before his death so as to show the wound, which I here show you. Judge Baby writes to his friend, Prof. D. C. MacCallum of Montreal, as follows: "I have much pleasure to-day in placing in your hands such information about St. Martin as Revd. Mr. Chicoine, Curé of St. Thomas, has just handed over to me. Alexis Bidigan, *dit* St. Martin, died at St. Thomas de Joliette on the 24th of June, 1880, and was buried in the cemetery of the parish on the 28th of the same month. The last sacraments of the Catholic church were ministered to him by the Revd. Curé Chicoine, who also attended at his burial service. The body was then in such an advanced stage of decomposition that it could not be admitted into the church, but had to be left outside during the funeral service. The family resisted all requests—most pressing as they were—on the part of the members of the medical profession for an autopsy, and also kept the body at home much longer than usual and during a hot spell of weather, so as to allow decomposition to set in

and baffle, as they thought, the doctors of the surrounding country and others. They had also the grave dug eight feet below the surface of the ground in order to prevent any attempt at a resurrection. When he died St. Martin was 83 years of age, and left a widow, whose maiden name was Marie Joly. She survived him by nearly seven years, dying at St. Thomas on the 20th of April, 1887, at the very old age of 90 years. They left four children still alive—Alexis, Charles, Henriette and Marie.

“Now I may add the following details for myself. When I came to know St. Martin it must have been a few years before his death. A law suit brought him to my office here in Joliette. I was seized with his interests; he came to my office a good many times, during which visits he spoke to me at great length of his former life, how his wound had been caused, his peregrinations through Europe and the United States, etc. He showed me his wound. He complained bitterly of some doctors who had awfully misused him, and had kind words for others. He had made considerable money during his tours, but had expended and thrown it all away in a frolicsome way, especially in the old country. When I came across him he was rather poor, living on a small, scanty farm in St. Thomas, and very much addicted to drink, almost a drunkard one might say. He was a tall, lean man, with a very dark complexion, and appeared to me then of a morose disposition.”

II. THE BOOK.

In the four periods in which Alexis had been under the care and study of Beaumont a large series of observations had been recorded, amounting in all to 238. A preliminary account of the case and of the first group of observations appeared in the *Philadelphia Medical Recorder* in January, 1825. During the stay in Washington in 1832 the great importance of the observations had become impressed on the Surgeon-General, Dr. Lovell, who seems to have acted in a most generous and

kindly spirit. Beaumont tried to induce him to undertake the arrangement of the observations, but Lovell insisted that he should do the work himself. In the spring of 1833 Alexis was taken to New York and there shown to the prominent members of the profession, and careful drawings and colored sketches were made of the wound by Mr. King. A prospectus of the work was issued and was distributed by the Surgeon-General, who speaks in a letter of sending them to Dr. Franklin Bache and to Dr. Stewart of Philadelphia, and in a letter from Dr. Bache to Dr. Beaumont acknowledging the receipt of a bottle of gastric juice, Bache states that he has placed the prospectus in Mr. Judah Dobson's store and has asked for subscribers. Beaumont did not find New York a very congenial place. He complained of the difficulty of doing the work owing to the vexatious social intercourse. He applied for permission to go to Plattsburgh, in order to complete the book. After having made inquiries in New York and Philadelphia about terms of publication he decided, as the work had to be issued at his own expense, that it could be as well and much more cheaply printed at Plattsburgh, where he would also have the advice and help of his cousin, Dr. Samuel Beaumont. In a letter to the Surgeon-General, dated June 10, 1833, he acknowledges the permission to go to Plattsburgh, and says: "I shall make my arrangements to leave here for Pl. in about a week to *rush* the execution of the Book as fast as possible. I am now having the drawings taken by Mr. King engraved here."

The summer was occupied in making a fresh series of experiments and getting the work in type. On December 3 he writes the Surgeon-General that the book will be ready for distribution in a few days and that 1,000 copies will be printed.

The work is an octavo volume of 280 pages, entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," by William Beau-

mont, M.D., Surgeon in the United States Army. Plattsburgh. Printed by F. P. Allen, 1833. While it is well and carefully printed, the paper and type are not of the best, and one can not but regret that Beaumont did not take the advice of Dr. Franklin Bache, who urged him strongly not to have the work printed at Plattsburgh, but in Philadelphia, where it could be done in very much better style. The dedication of the work to Joseph Lovell, M.D., Surgeon-General of the United States Army, acknowledges in somewhat laudatory terms the debt which Beaumont felt he owed to his chief, who very gratefully acknowledges the compliment and the kindly feeling, but characterizes the dedication as "somewhat apocryphal."

The work is divided into two main portions; first, the preliminary observations on the general physiology of digestion in seven sections: Section I, Of Aliment; Section II, Of Hunger and Thirst; Section III, of Satisfaction and Satiety; Section IV, Of Mastication, Insalivation and Deglutition; Section V, Of Digestion by the Gastric Juice; Section VI, Of the Appearance of the Villous Coat, and of the Motions of the Stomach; Section VII, Of Chylification and Uses of the Bile and Pancreatic Juice. The greater part of the book is occupied by the larger section of the detailed account of the four series of experiments and observations. The work concludes with a series of 51 inferences from the foregoing experiments and observations.

The subsequent history of the book itself is of interest, and may be dealt with here. In 1834 copies of the Plattsburgh edition, printed by F. P. Allen, were issued by Lilly, Wait & Co., of Boston.

In the Beaumont correspondence there are many letters from a Dr. McCall, in Utica, N. Y., who was an intimate friend of a Mr. Wm. Combe, a brother of the well-known physiologist and popular writer, Dr. Andrew Combe of Edinburgh. Doubtless it was through this connection that in 1838 Dr. Combe issued an edi-

tion in Scotland, with numerous notes and comments. (Appendix C.)

The second edition was issued from Burlington, Vt., in 1847, with the same title page, but after Second Edition there are the words, Corrected by Samuel Beaumont, M.D., who was Dr. William Beaumont's cousin. In the preface to this edition the statement is made that the first edition, though a large one of 3,000 copies, had been exhausted. This does not agree with the statement made in a letter of Dec. 3, 1833, to the Surgeon-General, stating that the edition was to be 1,000 copies. Of course more may have been printed before the type was distributed. While it is stated to be a new and improved edition, so far as I can gather it is a verbatim reprint, with no additional observations, but with a good many minor corrections. In an appendix (D) I give an interesting letter from Dr. Samuel Beaumont with reference to the issue of this edition.

A German edition was issued in 1834 with the following title: "Neue Versuche und Beobachtungen ueber den Magensaft und die Physiologie der Verdauung, auf eine hochst merkwurdige Weise wahrend einer Reihe von 7 Jahren, an einen und demselben Subject angestellt." Beaumont's earlier paper, already referred to, was abstracted in the *Magazin der auslandischen Litteratur der gesammten Heilkunde*, Hamburg, 1826, and also in the *Archives generales de Medecine*, Paris, 1828. I can not find that there was a French edition of the work.

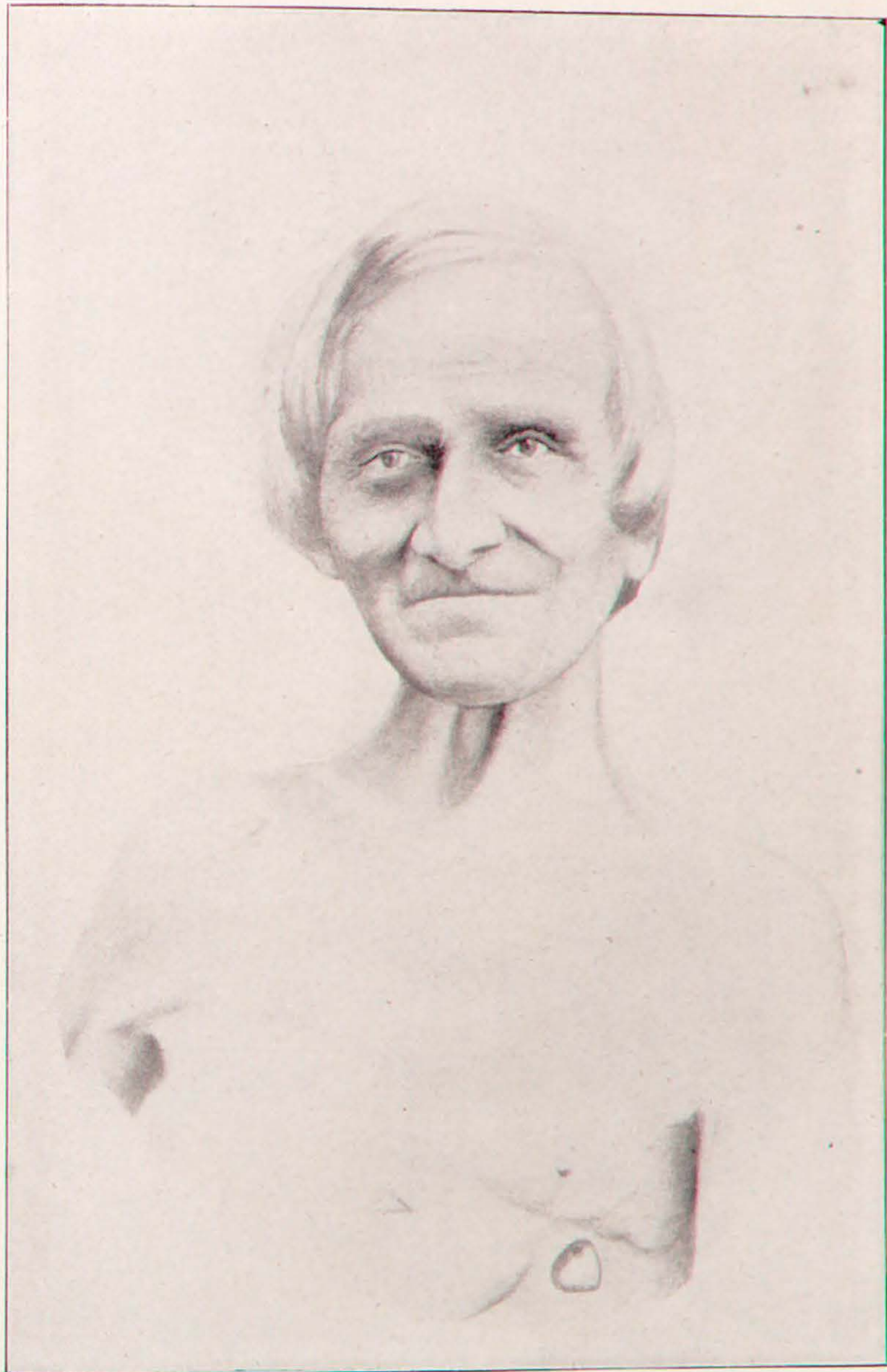
The "Experiments and Observations" attracted universal attention, both at home and abroad. The journals of the period contained very full accounts of the work, and within a few years the valuable additions to our knowledge filtered into the text-books of physiology, which to-day in certain descriptions of the gastric juice and of the phenomena of digestion even the very language of the work is copied.

III. THE VALUE OF BEAUMONT'S OBSERVATIONS.

There had been other instances of artificial gastric fistula in man which had been made the subject of experimental study, but the case of St. Martin stands out from all others on account of the ability and care with which the experiments were conducted. As Dr. Combe says, the value of these experiments consists partly in the admirable opportunities for observation which Beaumont enjoyed, and partly in the candid and truth-seeking spirit in which all his inquiries seem to have been conducted. "It would be difficult to point out any observer who excels him in devotion to truth and freedom from the trammels of theory or prejudice. He tells plainly what he saw and leaves every one to draw his own inferences, or where he lays down conclusions he does so with a degree of modesty and fairness of which few perhaps in his circumstances would have been capable."

To appreciate the value of Beaumont's studies it is necessary to refer for a few moment's to our knowledge of the physiology of digestion in the year 1832, the date of the publication. Take, for example, "The Work on Human Physiology" (published in the very year of the appearance of Beaumont's book), by Dunglison, a man of wide learning and thoroughly informed in the literature of the subject. The five or six old theories of stomach digestion, concoction, putrefaction, trituration, fermentation and maceration, are all discussed, and Wm. Hunter's pithy remark is quoted, "some physiologists will have it, that the stomach is a mill, others, that it is a fermenting vat, others, again, that it is a stew-pan; but, in my view of the matter, it is neither a mill, a fermenting vat nor a stew-pan; but a stomach, gentlemen, a stomach."

The theory of chemical solution is accepted. This had been placed on a sound basis by the experiments of Reaumur, Spallanzani and Stevens, while the studies of Tiedemann and Gmelin and of Prout had done much



ALEXIS ST. MARTIN, AGED 81.



WILLIAM BEAUMONT.

to solve the problems of the chemistry of the juice. But very much uncertainty existed as to the phenomena occurring during digestion in the stomach, the precise mode of action of the juice, the nature of the juice itself and its action outside the body. On all these points the observations of Beaumont brought clearness and light where there had been previously the greatest obscurity.

The following may be regarded as the most important of the results of Beaumont's observations: First, the accuracy and completeness of description of the gastric juice itself. You will all recognize the following quotation, which has entered into the text-books and passes current to-day. "Pure gastric juice, when taken directly out of the stomach of a healthy adult, unmixed with any other fluid, save a portion of the mucus of the stomach with which it is most commonly and perhaps always combined, is a clear, transparent fluid; inodorous; a little saltish, and very perceptibly acid. Its taste, when applied to the tongue, is similar to this mucilaginous water slightly acidulated with muriatic acid. It is readily diffusible in water, wine or spirits; slightly effervesces with alkalies; and is an effectual solvent of the *materia alimentaria*. It possesses the property of coagulating albumen, in an eminent degree; is powerfully antiseptic, checking the putrefaction of meat; and effectually restorative of healthy action, when applied to old, foetid sores and foul, ulcerating surfaces."

Secondly, the confirmation of the observation of Prout that the important acid of the gastric juice was the muriatic or hydrochloric. An analysis of St. Martin's gastric juice were made by Dunglison, at that time a professor in the University of Virginia, and by Benjamin Silliman of Yale, both of whom determined the presence of free hydrochloric acid. A specimen was sent to the distinguished Swedish chemist, Berzelius, whose report did not arrive in time to be included in

the work. In a letter dated July 19, 1834, he writes to Professor Silliman that he had not been able to make a satisfactory analysis of the juice. The letter is published in *Silliman's Journal*, Vol. 27, July, 1835.

Thirdly, the recognition of the fact that the essential elements of the gastric juice and the mucus were separate secretions.

Fourthly, the establishment by direct observation of the profound influence on the secretion of the gastric juice and on digestion of mental disturbances.

Fifthly, a more accurate and fuller comparative study of the digestion in the stomach with digestion outside the body, confirming in a most elaborate series of experiments the older observations of Spallanzani and Stevens.

Sixthly, the refutation of many erroneous opinions relating to gastric digestion and the establishment of a number of minor points of great importance, such as, for instance, the rapid disappearance of water from the stomach through the pylorus, a point brought out by recent experiments, but insisted on and amply proven by Beaumont.

Seventhly, the first comprehensive and thorough study of the motions of the stomach, observations on which, indeed, are based the most of our present knowledge.

And lastly, a study of the digestibility of different articles of diet in the stomach, which remains to-day one of the most important contributions ever made to practical dietetics.

The greater rapidity with which solid food is digested, the injurious effects on the stomach of tea and coffee, when taken in excess, the pernicious influence of alcoholic drinks on the digestion, are constantly referred to. An all-important practical point insisted on by Beaumont needs emphatic reiteration to this generation: "The system requires much less than is generally supplied to it. The stomach disposes of a definite

quantity. If more be taken than the actual wants of the economy require, the residue remains in the stomach and becomes a source of irritation and produces a consequent aberration of function, or passes into the lower bowel in an undigested state, and extends to them its deleterious influence. Dyspepsia is oftener the effect of over-eating and over-drinking than of any other cause."

One is much impressed, too, in going over the experiments, to note with what modesty Beaumont refers to his own work. He speaks of himself as a humble "enquirer after truth and a simple experimenter." "Honest objection, no doubt, are entertained against the doctrine of digestion by the gastric juice. That they are so entertained by these gentlemen I have no doubt. And I cheerfully concede to them the merit of great ingenuity, talents and learning, in raising objections to the commonly received hypothesis, as well as ability in maintaining their peculiar opinions. But we ought not to allow ourselves to be seduced by the ingenuity of argument or the blandishments of style. Truth, like beauty, when 'unadorned is adorned the most'; and in prosecuting these experiments and inquiries, I believe I have been guided by its light. Facts are more persuasive than arguments, however ingeniously made, and by their eloquence I hope I have been able to plead for the support and maintenance of those doctrines which have had for their advocates such men as Sydenham, Hunter, Spallanzani, Richerand, Abernethy, Broussais, Philip, Paris, Bostock, the Heidelberg and Paris professors, Dunglison, and a host of other luminaries in the science of physiology."

In reality Beaumont anticipated some of the most recent studies in the physiology of digestion. Doubtless many of you have heard of Professor Pawlow's, of St. Petersburg, new work on the subject. It has been translated into German, and I see that an English edition is advertised. He has studied the gastric juice in an iso-

lated pouch, ingeniously made at the fundus of the stomach of the dog, from which the juice could be obtained in a pure state. One of his results is the very first announced by Beaumont and confirmed by scores of observations on St. Martin, viz., that, as he says, "the gastric juice never appears to be accumulated in the cavity of the stomach while fasting." Pawlow has shown very clearly that there is a relation between the amount of food taken and the quantity of gastric juice secreted. Beaumont came to the same conclusion: "when aliment is received the juice is given in exact proportion to its requirements for solution." A third point on which Pawlow lays stress is the curve of secretion of the gastric juice, the manner in which it is poured out during digestion. The greatest secretion, he has shown, takes place in the earlier hours. On this point hear Beaumont: "It (the gastric juice) then begins to exude from the proper vessels and increases in proportion to the quantity of aliment naturally required and received." And again: "When a due and moderate supply of food has been received it is probable that the whole quantity of gastric juice for its complete solution is secreted and mixed with it in a short time." A fourth point, worked out beautifully by Pawlow, is the adaptation of the juice to the nature of the food, on which I do not see any reference by Beaumont, but there are no experiments more full than those in which he deals with the influence of exercise, weather and the emotions on the quantity of the juice secreted.

IV. MAN AND DOCTOR.

Sketches of Dr. Beaumont's life have appeared from time to time. There is a worthy memoir by Dr. T. Reyburn in the *St. Louis Medical and Surgical Journal*, 1854, and Dr. A. J. Steele, at the first annual commencement of the Beaumont Medical College, 1887, told well and graphically the story of his life. A few years ago Dr. Frank J. Lutz, of this city, sketched his life

for the memorial meeting of the Michigan State Medical Society on the occasion of the dedication of a Beaumont monument.

Among the papers kindly sent to me by his daughter, Mrs. Keim, are many autobiographical materials, particularly relating to his early studies and to his work as a surgeon in the War of 1812. There is an excellent paper in the handwriting, it is said, of his son, giving a summary of the earlier period of his life. So far as I know this has not been published, and I give it in full:

Dr. William Beaumont was born in the town of Lebanon, Conn., on the 21st day of November, A. D. 1785. His father was a thriving farmer and an active politician of the proud old Jeffersonian school, whose highest boast was his firm support and strict adherence to the honest principles he advocated. William was his third son, who, in the winter of 1806-7, in the 22d year of his age, prompted by a spirit of independence and adventure, left the paternal roof to seek a fortune and a name. His outfit consisted of a horse and cutter, a barrel of cider, and one hundred dollars of hard-earned money. With this he started, laying his course northwardly, without any particular destination, Honor his rule of action, Truth his only landmark, and trust placed implicitly in Heaven. Traversing the western part of Massachusetts and Vermont in the spring of 1807 he arrived at the little village of Champlain, N. Y., on the Canada frontier—an utter stranger, friendless and alone. But honesty of purpose and true energy invariably work good results. He soon gained the people's confidence and was entrusted with their village school, which he conducted about three years, devoting his leisure hours to the study of medical works from the library of Dr. Seth Pomeroy, his first patron. He then went over to St. Albans, Vt., where he entered the office of Dr. Benjamin Chandler and commenced a regular course of medical reading, which he followed for two years, gaining the utmost confidence and esteem of his kind preceptor and friends. About this time the War of 1812 commenced, and he applied for an appointment in the U. S. Army, successfully. He was appointed assistant-surgeon to the Sixth Infantry, and joined his regiment at Plattsburgh, N. Y., on the 13th of September, 1812. On the 19th of March, 1813, he marched from Plattsburgh with the First Brigade, for Sackett's Harbor, where they arrived on the 27th inst. Here he remained in camp till the 22d of April, when he embarked with the troops on Lake Ontario. His journal will best tell this portion of his history:

"April 22, 1813.—Embarked with Captain Humphreys, Wal-

worth and Muhlenburg, and companies on board the Schooner 'Julia.' The rest of the brigade, and the Second, with Foresith's Rifle Regiment and the Eighth Artillery, on board a ship, brig and schooner—remain in the harbor till next morning.

"23d.—11 o'clock a. m.—Weighs anchor and put out under the impression we were going to Kingston. Got out 15 or 20 miles—encountered a storm—wind ahead and the fleet returned to harbor.

"24th.—6 o'clock a. m.—Put out with a fair wind—mild and pleasant—the fleet sailing in fine order.

"26th.—Wind pretty strong—increasing—waves run high, tossing our vessels roughly. At half past four pass the mouth of Niagara river. This circumstance baffles imagination as to where we are going—first impressed with the idea of Kingston—then to Niagara—but now our destination must be 'Little York.' At sunset came in view of York Town and the Fort, where we lay off some 3 or 4 leagues for the night.

"27th.—Sailed into harbor and came to anchor a little below the British Garrison. Filled the boats and effected a landing, though not without difficulty and the loss of some men. The British marched their troops down the beach to cut us off as landing, and, though they had every advantage, they could not effect their design. A hot engagement ensued, in which the enemy lost nearly a third of their men and were soon compelled to quit the field, leaving their dead and wounded strewn in every direction. They retired to the Garrison, but from the loss sustained in the engagement, the undaunted courage of our men, and the brisk firing from our fleet, with the 12 and 32 pounders, they were soon obliged to evacuate it and retreat with all possible speed.—Driven to this alternative they devised the inhuman project of blowing up their magazine, containing 300 pounds of powder, the explosion of which had well-nigh destroyed our army. Over 300 were wounded and about 60 killed on the spot, by stones of all dimensions falling, like a shower of hail, in the midst of our ranks. A most distressing scene ensues in the hospital. Nothing is heard but the agonizing groans and supplications of the wounded and the dying. The surgeons wade in blood cutting off arms and legs and trepaning heads, while the poor sufferers cry, 'O, my God! Doctor, relieve me from this misery! I can not live!' 'Twas enough to touch the veriest heart of steel and move the most relentless savage. Imagine the shocking scene, where fellow-beings lie mashed and mangled—legs and arms broken and sundered—heads and bodies bruised and mutilated to disfigurement! My deepest sympathies were roused—I cut and slashed for 36 hours without food or sleep.

"29th.—Dressed upwards of 50 patients—from simple contusions to the worst of compound fractures—more than half the latter. Performed two cases of amputation and one of trepaning. At 12 p. m. retired to rest my fatigued body and mind."

One month after the taking of York he witnessed the storming of Fort George. The troops were transported from York to "Four-Mile Creek" (in the vicinity of Ft. George), where they encamped from the 10th of May to the 27th, when they advanced to the attack. His journal runs thus:

"May 27 (1813).—Embarked at break of day—Col. Scott with 800 men, for the advanced guard, supported by the First Brigade, commanded by General Boyd, moved in concert with the shipping to the enemy's shore and landed under their battery and in front of their fire with surprising success, not losing more than 30 men in the engagement, though the enemy's whole force was placed in the most advantageous situation possible. We routed them from their chosen spot—drove them from the country and took possession of the town and garrison."

On the 11th of September, 1814, he was at the Battle of Plattsburgh, still serving as assistant-surgeon, though doing all the duty of a full surgeon. At the close of the war, in 1815, when the Army was cut down, he was retained in service, but resigned soon after, deeming himself unjustly treated by the government in having others, younger and less experienced, promoted over him.

In 1816 he settled in Plattsburgh and remained there four years in successful practice. In the meantime his army friends had persuaded him to join the service again, and, having applied, he was reappointed, in 1820, and ordered to Ft. Mackinac as post surgeon. At the end of the first year he obtained leave of absence, returned to Plattsburgh and married one of the most amiable and interesting ladies of that place. (She still survives her honored husband, and in her green old age is loved devotedly by all who know her.) He returned to Mackinac the same year, and in 1822 came in possession of Alexis St. Martin, the subject of his "Experiments on the Gastric Juice." By the accidental discharge of his gun, while hunting, St. Martin had dangerously wounded himself in the abdomen and came under the treatment of Dr. Beaumont, who healed the wound (in itself a triumph of skill almost unequalled) and in 1825 commenced a series of experiments, the results of which have a world-wide publication. These experiments were continued, with various interruptions, for eight years, during which time he was ordered from post to post—now at Niagara, N. Y., anon as Green Bay, Mich., and finally at Fort Crawford, on the Mississippi. In 1834 he was ordered to St. Louis, where he remained in service till 1839, when he resigned. He then commenced service with the citizens of St. Louis, and from that time till the period of his last illness, enjoyed an extensive and distinguished practice, interrupted only by the base attacks of a few disgraceful and malicious knaves (self-deemed members of the medical profession) who sought to destroy a reputation which they could not share.

They gained nothing except some little unenviable notoriety and they have skulked away like famished wolves, to die in their hiding places.

The dates of Beaumont's commissions in the army are as follows: Surgeon's Mate, Sixth Regiment of Infantry, Dec. 2, 1812; Cavalry, March 27, 1819; Post Surgeon, Dec. 4, 1819; Surgeon First Regiment and Surgeon, Nov. 6, 1826.

From the biographical sketches of Reyburn, Steele and Lutz, and from the personal reminiscences of his friends, Drs. J. B. Johnson, S. Pollak and Wm. McPheeters, who fortunately remains with you, full of years and honors, we gather a clearly-defined picture of the latter years of his life. It is that of a faithful, honest, hard-working practitioner, doing his duty to his patients, and working with zeal and ability for the best interests of the profession. The strong common sense which he exhibited in his experimental work made him a good physician and a trusty adviser in cases of surgery. Among his letters there are some interesting pictures of his life, particularly in his letters to his cousin, Dr. Samuel Beaumont. Writing to him April 4, 1846, he says:

I have a laborious, lucrative and increasing practice, more than I can possibly attend to, though I have an assistant, Dr. Johnson, a young man who was a pupil of mine from 1835 to 1840. He then went to Philadelphia a year or two to attend lectures, and graduated, and returned here again in 1842, and has been very busy ever since and is so now, but notwithstanding I decline more practice daily than half the doctors in the city get in a week. You thought when you were here before that there was too much competition for you ever to think of succeeding in business here—there is ten times as much now and the better I succeed and prosper for it. You must come with a different feeling from your former—with a determination to follow in my wake and stem the current that I will break for you. I am now in the grand climacteric of life, three-score years and over, with equal or more zeal and ability to do good and contribute to professional service than at forty-five, and I now look forward with pleasing anticipation of success and greater usefulness—have ample competence for ourselves and children, and no doleful or dreaded aspect of the future—to be sure I have to wrestle with some adverse circumstances of

life, and more particularly to defend myself against the envious, mean and professional jealousies and the consequent prejudices of some men, but I triumph over them all and go ahead in defiance of them.*

His professional work increased enormously with the rapid growth of the city, but he felt, even in his old age, that delicious exhilaration which it is your pleasure and privilege to enjoy here in the west in a degree rarely experienced by your eastern confrères. Here is a cheery paragraph from a letter dated Oct. 20, 1852: "Domestic affairs are easy, peaceable and pleasant. Health of community good—no severe epidemic diseases prevalent—weather remarkably pleasant—business of all kinds increasing—product of the earth abundant—money plenty—railroads progressing with almost telegraphic speed—I expect to come to Plattsburgh next summer all the way by rail."

But work was becoming more burdensome to a man nearing threescore years and ten, and he expresses it in another letter when he says: "There is an immense professional practice in this city. I get tired of it, and have been trying hard to withdraw from it altogether, but the more I try the tighter I seem to be held to it by the people. I am actually persecuted, worried and almost worn out with valetudinarian importunities and hypochondriacal groans, repinings and lamentations—Amen."

He continued at work until March, 1853, when he had an accident—a fall while descending some steps. A few weeks later a carbuncle appeared on the neck, and proved fatal April 25. One who knew him well wrote the following estimate (quoted by Dr. F. J. Lutz in his sketch of Beaumont):

"He was gifted with strong natural powers, which working upon an extensive experience in life, resulted in a species of natural sagacity, which, as I suppose,

* He had evidently hopes that when his cousin and son arrived with Alexis they would arrange and plan for another series of experiments and in another year or two make another book, better than the old one.

was something peculiar in him, and not to be attained by any course of study. His temperament was ardent, but never got the better of his instructed and disciplined judgment, and whenever or however employed, he ever adopted the most judicious means for attaining ends that were always honorable. In the sick room, he was a model of patience and kindness, his intuitive perceptions, guiding a pure benevolence, never failed to inspire confidence, and thus he belonged to that class of physicians whose very presence affords Nature a sensible relief."

You do well, citizens of St. Louis and members of our profession, to cherish the memory of William Beaumont. Alive you honored and rewarded him, and there is no reproach against you of neglected merit and talents unrecognized. The profession of the northern part of the state of Michigan has honored itself in erecting a monument to his memory near the scene of his disinterested labors in the cause of humanity and science. His name is linked with one of your educational institutions, and joined with that of a distinguished laborer in another field of practice. But he has a far higher honor than any you can give him here—the honor that can only come when the man and the opportunity meet—and match. Beaumont is the pioneer physiologist of this country, the first to make an important and enduring contribution to this science. His work remains a model of patient, persevering investigation, experiment and research, and the highest praise we can give him is to say that he lived up to and fulfilled the ideals with which he set out and which he expressed when he said: "Truth, like beauty, when 'unadorned, is adorned the most,' and, in prosecuting these experiments and enquiries, I believe I have been guided by its light."

APPENDIX A.

The Beaumont papers in the possession of his daughter, Mrs. Keim of St. Louis, consist of (1) interesting certificates from his preceptors, Dr. Pomeroy and Dr. Chandler, the license from the Third Medical Society of Vermont, the commissions in the

U. S. Army, several certificates of honorary membership in societies, and the parchment of the M.D. degree conferred upon him, *honoris causa*, by the Columbian University of Washington, 1833; (2) a journal containing his experiences in the War of 1812, from which I give an extract, a journal of his trip to Fort Mackinac, a journal containing the reports of many cases, among them that of St. Martin (in addition there is a protocol of the case in loose folio sheets), a journal of the experiments, and a commonplace book of receipts and jottings; (3) an extensive correspondence relating to St. Martin and the book, and many rough drafts of sections of the book; (4) a large mass of personal correspondence, much of it of interest as relating to conditions of practice in St. Louis.

The picture reproduced here in his army uniform is from a miniature; the picture which has been previously reproduced is of an older man from a daguerreotype. It is satisfactory to know that the ultimate destination of this most valuable collection of papers is the Surgeon-General's Library of the United States Army, of which Dr. Beaumont was so distinguished an ornament.

APPENDIX B.

On Oct. 20, 1853, he writes to his cousin, Dr. Samuel Beaumont, on the subject of "that old, fistulous Alexis," as he calls him. "Alexis' answer to yours is the very fac-simile or stereotype of all his Jesuitical letters to me for the last fifteen years. His object seems only to be to get a heavy bonus and undue advance from me and then disappoint and deceive me, or to palm and impose himself and whole family upon me for support for life.

"I have evaded his designs so far; but I verily fear that the strong and increasing impulse of conscious conviction of the great benefits and important usefulness of further and more accurate physiological investigation of the subject will compel me to still further efforts and sacrifices to obtain him. Physiological authors and most able writers on dietetics and gastric functions generally demand it of me in trumpet tones.

"I must have him at all hazards, and obtain the necessary assistance to my individual and private efforts or transfer him to some competent scientific institution for thorough investigation and report—I must retrieve my past ignorance, imbecility and professional remissness of a quarter of a century, or more, by double diligence, intense study and untiring application of soul and body to the subject before I die—

Should posthumous Time retain my name,
Let historic truths declare my fame.

"Simultaneous with this I write to Mr. Morrison and Alexis my last and final letters—perhaps, proposing to *him*, as bribe to his cupidity, to give him \$500 to come to me *without* his family, for one year—\$300 of them for his salary, and \$200

for the support and contentment of his family to remain in Canada in the meantime—with the privilege of bringing them on here another year, upon my former proposition of \$300 a year, at his own expense and responsibility and support them himself after they get here out of his \$300 salary—I think he will take the bait and come on this fall, and when I get him alone again into my keeping and engagement, I will take good care to control him as I please.”

APPENDIX C.

Letter from Dr. Andrew Combe, May 1, 1838:

“My Dear Sir—May I beg your acceptance of the accompanying volumes as a small expression of my respect for your character and scientific labors. I need not detain you by repeating in this note the high estimation in which I hold you. The volumes herewith sent will, I trust, convince you of the fact, and that it will not be my fault if you do not receive the credit justly due to your valuable and disinterested services. I remain, My Dear Sir,

Very respectfully yours,

“ANDW. COMBE.”

APPENDIX D.

Letter from Dr. Samuel Beaumont, March 16, 1846:

“Your letter of the 1st of February arrived here in the course of mail, and I have attended to the business which you authorized me to do. I am afraid, however, that you will be disappointed, and perhaps dissatisfied with the arrangement. Mr. Goodrich came here some five or six days after I received your letter, and made his proposal, which was to give you every tenth copy for the privilege of publishing an edition. The number he proposed to publish was fifteen hundred, which would give you 150 copies. I did not like to close the bargain on this condition, and he was not disposed to give any more. This was in the evening. I told him to give me time till the next morning, and I would make up my mind. In the morning, after consultation, I concluded to offer him the copyright for the unexpired time (only one year) for two hundred copies. After some demurring, we closed the bargain. I then thought and I still think it was not enough; but it was all I could get. In making up my mind the following considerations presented themselves: First, that the copyright would expire in one year, and he would then have the right to print it without consulting the author; second, that it would be somewhat mortifying to the author not to have his work republished, even if no great pecuniary benefit was to be obtained by such a republication; and it appeared to me to be quite certain that a new edition would not be soon printed, if I let this opportunity slip; third, I have been long anxious, as I presume you have been, to see the work gotten up in a better dress than it originally had, and in a way which will give it a general credit

and more notoriety among all classes of the reading public than it has heretofore possessed—in fact, make it a standard work; fourth, it has given us a chance to give it a thorough correction, a thing which was very desirable. The work, you recollect, was got up in a great hurry, and a great many errors escaped our notice. You may also recollect that the Philadelphia reviewer spoke of the inaccuracies in the work. And he had reason enough for it. In looking over the work critically with a view of correction, I have been perfectly astonished at the errors that occur on almost every page. And although we understood perfectly what we meant to say, the reader would find it somewhat difficult to decipher our meaning. In the first 140 pages I made nearly 300 corrections. These are practically merely verbal alterations or change of phrases or sentences so as to make them more accurate or perspicuous. I have in no case so changed the text as to give it a different meaning. I flatter myself that it will now be more worthy the public patronage; and if for no other, this chance for correction I consider alone almost a sufficient remuneration for the brief limits of the copyright. I have also written a preface for the second edition, making quotations from American and European authorities in praise of the merits of the work. From delicacy I have written this as from the publisher. I think it is pretty well done. The work will probably be published in the course of about a month, and those designed for you will be delivered to me, when I shall send them to you. He guarantees not to sell in the state of Missouri, or the states south and west of that state. But that, of course, is all gammon. The book will be thrown into market, and he can not control the direction in which it will go.”

ON THE ADVANTAGES OF
A TRACE OF ALBUMIN
AND A FEW TUBE CASTS IN
THE URINE OF CERTAIN
MEN ABOVE FIFTY YEARS
OF AGE.

BY

WILLIAM OSLER, M. D., LL.D.,
BALTIMORE.

Reprinted from the

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for November 23, 1901.

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OF A
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TUBE CASTS IN THE URINE OF CERTAIN
MEN ABOVE FIFTY YEARS OF AGE.

By WILLIAM OSLER, M. D., LL.D.,

BALTIMORE,

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY.

Year by year I see an increasing number of cases which justify the somewhat paradoxical heading of this brief paper. I do not wish to minimize the importance of the information to be obtained by an examination of the urine, but we must ever bear in mind the adage—true to-day as well as in the times of the old “Pisse-Prophets;” *urina est meretrix, vel mendax*—the urine is a harlot or a liar.

What I wish to emphasize is the importance of basing a judgment less on the urine than on the general condition of the patient. The cases to which I refer are well known to every examiner for life insurance. The successful business or professional man, who lives intensely and strives hard to get wealth or reputation, or both, and who takes plenty of good food three times a day, with two or three

glasses of spirits, and smokes six or ten cigars, works in blissful ignorance that his bodily mechanism is constructed on much the same principles as a steam engine. In the one, as in the other, fuel, combustion, transformation of energy, and the accumulation of waste materials tell the story of the day's work. The engineer as a rule understands his machine better, and accommodates the amount of coal burnt to the size of the engine and to the amount of work required. He does not "stoke" *No. 15*, a small yard engine employed to shunt empty cars, as he would *No. 580*, the superb machine drawing a limited express. Another important difference is the automatic action of the human engine in getting rid of its ashes and clinkers. The waste-pipes bear the strain of the extra work when the amount of fuel consumed and energy liberated is out of all proportion to the work demanded. *No. 15* "stoked" as if it were *No. 580*, drawing the lightning limited, would go to pieces very rapidly. So it is with our business friend, Mr. Silas Lapham. Careless stoking with high pressure for twenty-five years and bad treatment of his machine mean early degenerations, and his waste-pipes—kidneys—are often the first to show signs of ill usage. Such a man receives a very rude shock when in a polite note the head office of the New York Mutual or Equitable Company declines the extra fifty thousand dollars which he had wished to place upon his life, as the medical examiner reports "a slight trace of albumin and a few tube casts" in the urine. After a period of great distress and worry Mr. Lapham begins to take heart, and on the advice of his family physician remodels his mode

of life. He restricts his appetite, takes a light lunch and a moderate dinner, gives up whiskey and champagne, resigns from six or eight boards, and at fifty starts to live a rational life. Prospectively nothing could have been more advantageous than the discovery in the urine of a trace of albumin and a few tube casts.

Let me give a few illustrations. Throughout the winter of 1880-'81 I repeatedly examined for Dr. R. P. Howard the urine of a very distinguished man in public life in Canada, in whose urine albumin and tube casts had been accidentally discovered, on the occasion of his applying for additional life insurance. At this date the patient was a man of nearly sixty, who had lived a very active life, and who had been very careless in his habits of eating and drinking. I remember well the great anxiety of the patient himself and the distress that was felt at the possibility that the career of so useful a man would be cut short. In the summer of 1881 I went to England on the same steamer with him, and in London I discussed his condition with Sir Andrew Clarke, who took a very sombre view of the case. After a year or more of rest, the patient gradually got over his fright and began to resume work, of which he has in the past twenty years done perhaps quite as much as he did in the previous twenty years. He is still alive—an octogenarian of exceptional vigor.

Many of the most notable cases are those in which the patients have been rejected for life insurance. In the cathedral at Antwerp this summer I was touched on the shoulder and a voice in my ear whispered, "Not dead yet!" On turning I saw a gentle-

man who came to me on the 30th of January, 1891, at the age of fifty-three, in a condition of great trepidation, having been rejected a few days before for Bright's disease. He had been a hard worker and a high liver, and had a marked gouty history. In the ten years I have seen him once or twice professionally, and he has tried on several occasions to get additional insurance, but the urine, he tells me, though sometimes free from albumin, has, on centrifugalizing, a few tube casts. He is to-day a vigorous man of sixty-three.

Another interesting patient belonging to the same group of "the rejected of the life insurance companies," was a prominent politician, aged sixty, whom I saw on April 23, 1893, also much distressed in mind after the discovery of albumin and tube casts in the urine. He had been a very hard worker and a pretty steady drinker to his forty-fifth year, but since that date he has been very temperate. The patient had regarded himself as a very healthy man, and was much shocked to find his application for additional insurance refused. I have seen him at intervals, and while he has retired from active work, he is to-day a very healthy man of sixty-eight.

What I wish to call special attention to is the fact that in men in the fifth and sixth decades albuminuria is by no means infrequent and not always serious. It is probably the expression of presenile changes in the kidneys, the result of arterial degeneration, and is often a renal inadequacy, to use Clarke's term, not of vital importance. Neither the presence of albumin nor the number and variety of the casts

have the same value in estimating the character of the disease and the prognosis as other factors.

The points on which one should lay special stress as indicative of serious disease are:

1. Persistent low specific gravity of the urine, 1.008 to 1.012.

2. The state of the heart and arteries. Marked sclerosis of the peripheral arteries, with the apex beat of the heart an inch or two outside the nipple line, and a ringing, highly accentuated aortic second sound.

3. The presence of albuminuric retinitis.

It is not always easy to reach a decision, as there are cases in which the detection of a trace of albumin and a few tube casts first calls attention to the existence of serious organic disease. Two conditions have to be carefully differentiated. First, a primary arteriosclerosis, manifest sometimes as early as the fourth decade, and quite common in this country in men who live at very high tension, and who eat and drink a great deal. It is surprising how often this state is overlooked by the general practitioner. The renal changes are secondary, and are expressed by a transitory albuminuria, a not very low specific gravity of the urine, which is not in very large amount. The kidneys post mortem are often of full size, red and beefy in color, with a patchy, cortical sclerosis.

Secondly, the granular, contracted kidneys. Here the ætiological factors are all-important. The cases, which are less common than the arteriosclerotic variety, are met with in young persons consecutive to scarlet fever and other infectious disorders, in

middle-aged individuals who have had gout, in workers in lead ; while in others, in whom no definite factors can be determined, it would seem as if the kidneys had become prematurely aged and hard and fibroid. The cardiovascular changes are very much the same as in the arteriosclerotic group, uræmic symptoms are much more frequent, persistent headache is a notable feature, and retinal changes are very much more common.

Very few of us are made as was the Deacon's masterpiece, the wonderful One Hoss Shay, and lurking somewhere there is a weakest spot, very often in our modern mode of life the kidneys, which, to use the language of the Autocrat's fine poem, may begin to show "a general flavor of mild decay" in the fourth or fifth decade. In very many cases the albumin and the few hyaline casts are simply the expression of this "mild decay" in the kidneys, and not of a condition serious enough to be called Bright's disease. A very important factor, I am sure, is the excessive amount of food eaten. I am much impressed by Aphorism 13 of George Cheyne's *Essay on Regimen*, so well known to our grandfathers ; it is worth quoting, as containing the one important element, I think, in the treatment of the condition of which I am speaking : "Every *wise* man, after *fifty*, ought to begin to lessen at least the *quantity* of his *aliment* ; and if he would continue free of great and dangerous distempers, and preserve his *senses* and *faculties* clear to the *last*, he ought every seven years to go on abating gradually and sensibly, and at last *descend* out of life as he *ascended* into it, even into the child's diet."

In conclusion, let me not be misunderstood. A trace of albumin and a few tube casts are danger signals, the red lights which may mean an open draw-bridge or a wrecked road ahead; but they may be simply warnings to the engineer to "go slow," that the pace is too rapid for the state of the track, and it is to the latter significance of the "red lights" that I wish to call attention.

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CONGENITAL ABSENCE OF THE ABDOMINAL MUS-
CLES, WITH DISTENDED AND HYPERTRO-
PHIED URINARY BLADDER.

BY WILLIAM OSLER, M. D.,

Professor of Medicine, Johns Hopkins University.

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In the summer of 1897 a case of remarkable distension of [331]
the abdomen was admitted to the wards, with greatly dis-
tended bladder, and on my return in September, Dr. Fitcher,
knowing that I would be interested in it, sent for the child.
The accompanying figures, I and II, from photographs, show
a very remarkable and unusual pattern of "abdominal tumid-
ity," differing in an interesting way from the picture of the
dilated colon in children, and resembling rather that of the
ascitic abdomen.

The examination showed that the child had practically
no abdominal muscles.

On looking up the literature I can find reports of only two
similar cases. In the Clinical Society's Transactions (Vol.
28, 1895), R. W. Parker describes the condition of a newly
born infant, weighing five and a half pounds, with a very
large, flaccid abdomen, through which the outlines of the in-
testinal coils could be clearly seen, and the outlines of the
abdominal organs easily felt. The abdominal wall was as
thin as parchment. Along the middle line, where the rectus
muscles should be found, there was little more resistance
than over the lateral regions. The oblique and transversalis
muscles were apparently quite undeveloped. The umbilicus
was not depressed, it was in normal position, but resembled a
surface scar. The child died not long after birth. There
was no trace of any muscle representing the transversalis ab-
dominis. There was a thin layer of muscular fibres passing

[331] from the cartilages of the ribs to the level of the eighth costal cartilage, where there was the first linea transversa. The body of the muscle was well marked on the right, but on the

[332]

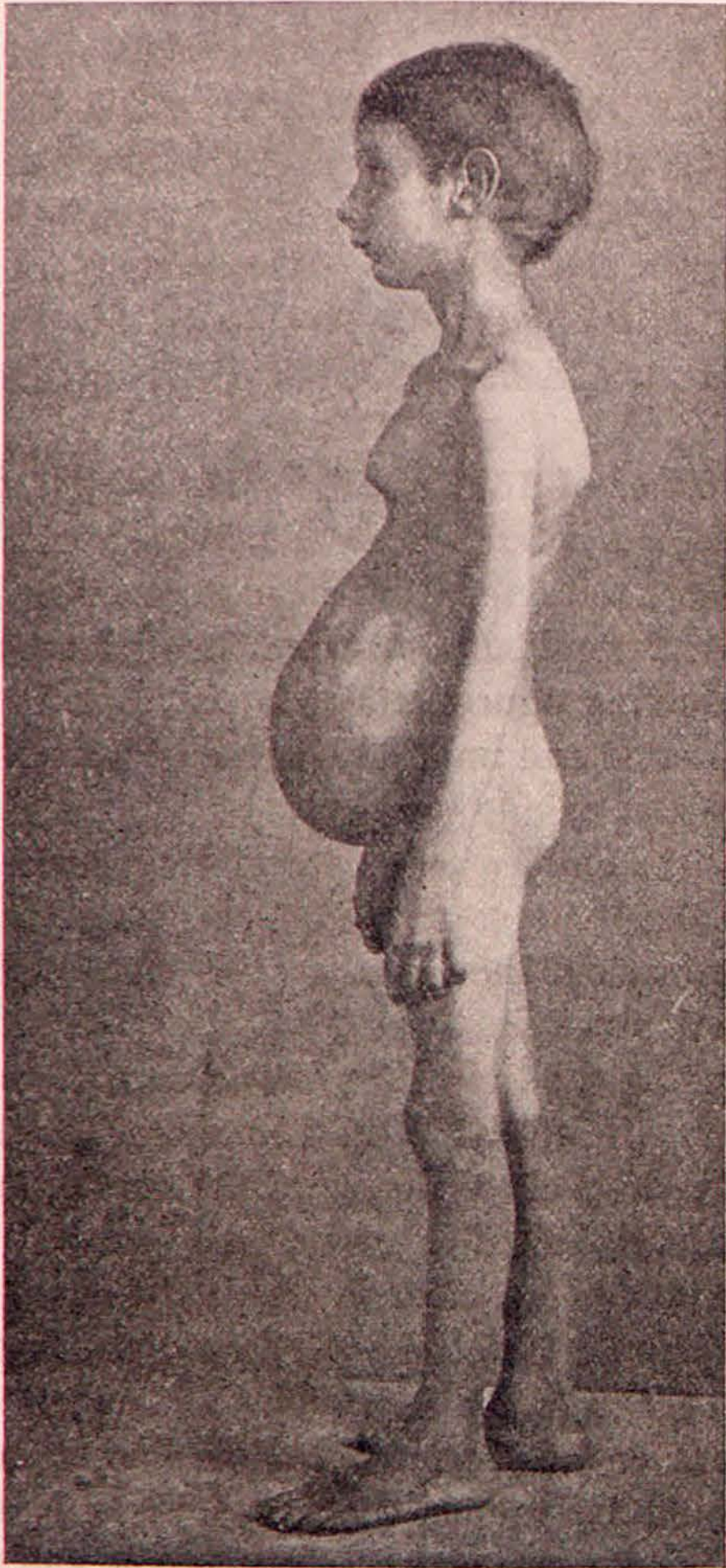


FIG. 1.

[331] left it was but faintly seen. Further down there was the merest trace of muscular fibres, representing the rectus on either side. The most remarkable associated condition in this case

was the enormous hypertrophy of the bladder, which was [331]
situated wholly within the abdominal cavity. There was no
obstruction anywhere in the urethra or prepuce. The open-

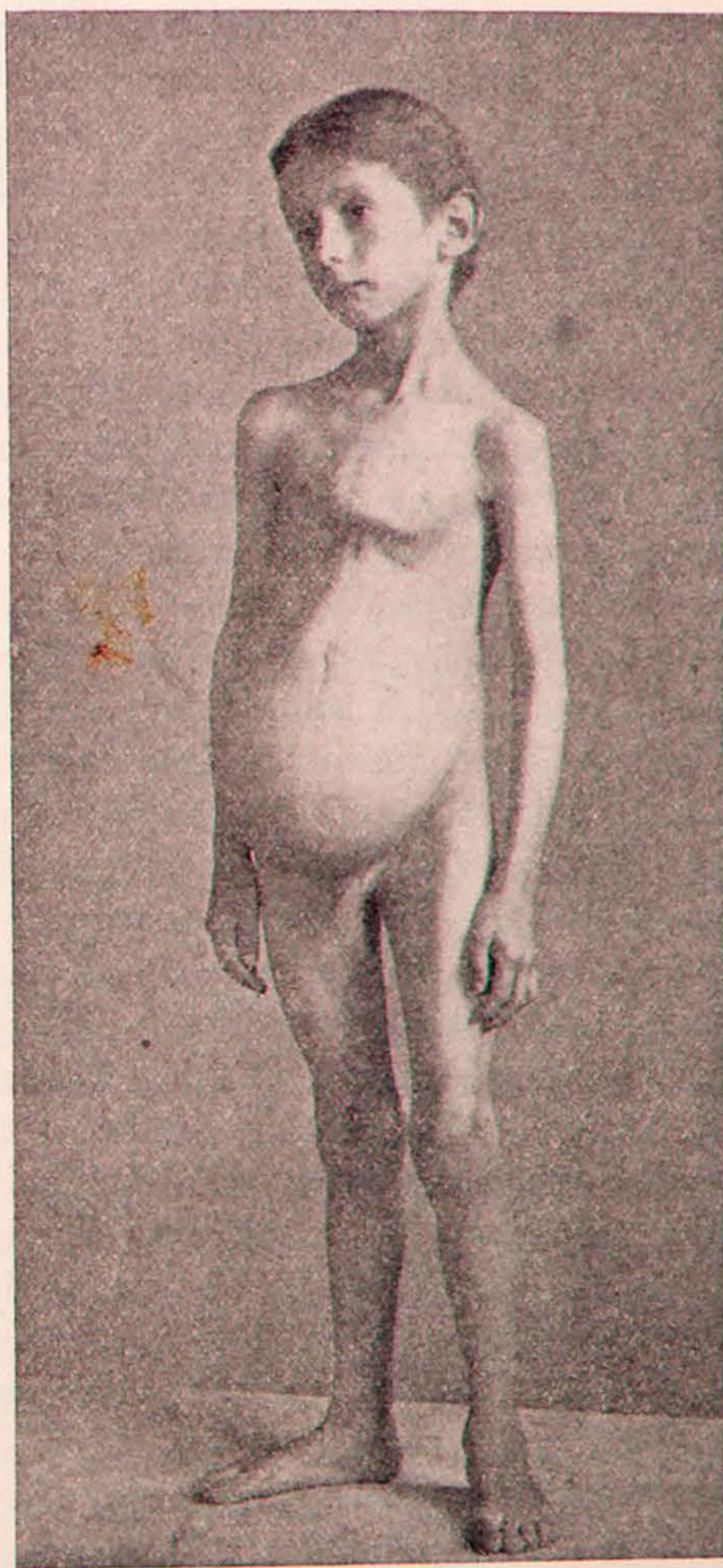


FIG. 2.

ings of the ureters into the bladder were quite free. The [331]
ureters and pelves of the kidneys were greatly dilated and
hypertrophied.

[331] In 1896, Dr. Leonard Guthrie reported to the Pathological Society of London (Transactions, Vol. 47), the history of a male infant, aged nine weeks, pigeon-breasted, very bony and emaciated, with a greatly distended abdomen. Extending between the pubes and the white, linear cicatrix corresponding to the umbilical scar there was a smooth, elastic tumor, corresponding to a distended gall-bladder. The abdominal walls were excessively thin and loose, and seemed to show the coils of the distended intestines on either side, but post-mortem these coils which looked like the intestines [332] proved to be the enormously dilated and convoluted ureters. The liver, spleen and kidneys could be easily palpated. The child wasted rapidly and died when about ten weeks old. Of the recti only the two upper segments as far as the second linea transversa showed muscular fibres. Below this level no trace of muscle could be discerned. The costal origins of the obliqui and transversales showed muscular structures for about two fingers' breadth below the ribs. The muscles of the back, of the thorax and of the extremities were well developed. Here again the most remarkable features related to the urinary organs. The bladder reached as high as the scar of the navel, and the walls were a quarter of an inch in thickness. The ureters were dilated to the size of the small intestines of an adult, and were remarkably tortuous. After death they exactly resembled, and at first were taken to be, portions of distended small intestine, as they were thought to be when seen through the weakened abdominal walls during life. The orifices of the ureters into the bladder admitted a blow-pipe. There was no obstruction in the ureters; there was no stricture of the urethra, and no phimosis. The kidneys were not enlarged, but the pelves were dilated. The position of the testes was not stated.

An important point in Dr. Guthrie's case was that there was no trace of a urachus, and the bladder was closely adherent to the inner surface of the umbilical scar, so much so that it could not be removed without the scar and the adjoining portions of the abdominal skin.

The history of my case is as follows:

Claudius K., aged 6, admitted July 13, 1897, complaining

of stomach trouble, and difficulty in passing the urine. The [332]
chest has been deformed, the mother says, since birth.

The family history is good. One other child; well and strong; parents are healthy.

Personal History.—The child was well until the second summer, when he had severe stomach trouble. There have been recurrences of these attacks each year. From the account some of them have been gastric attacks, with nausea and vomiting, but others, and apparently the chief troubles, have been with the urine. The spells last four or five weeks, and they have been getting more frequent. In the intervals he is pretty well and strong, and has a large appetite.

His present attack began about a week ago, and he complained of pains in the abdomen and much burning sensation in passing water. He has become very weak; has not had any vomiting. He has had some headache.

The patient was a poorly nourished child, looking anæmic. He complained of much pain, chiefly in the hypogastric and [333]
lower umbilical regions. On inspection the condition to be described was noted by Dr. Fitcher, but in particular there was a remarkable fulness in the hypogastric and lower umbilical regions, which were occupied by an ovoid mass corresponding to a dilated bladder. The urine which was obtained by catheter was free from albumin, contained a good many leucocytes. The child had a temperature ranging from 99° to 102°. He passed the urine very frequently, an average of from 60 to 70 cc. In the twenty-four hours ending 5.30 on July 13th he passed urine 20 times, a total amount of 1090 cc.; on the 14th he passed urine 18 times, a total amount of 835 cc.; on the 15th he passed urine 15 times, a total of 1060 cc.

The condition was so unusual that on my return in September the case was sent for, and on the 8th I dictated the following note:

In the erect posture the attitude is very remarkable. It is not quite symmetrical, being fuller on the right side than on the left. The navel looks stretched and distended. It is linear, forming a furrow about an inch in length, and below it are furrows in the skin—crow's feet. Above there is seen

[333] distinctly on either side the attachment of the recti to the sternum and costal margin. The skin over the abdomen is thin; the veins are a little prominent. When he bends back slight movements of the abdominal muscles beneath the skin are seen.

Recumbent.—Belly flattens out in front, extends at the flanks. Coils of intestines can be seen in peristalsis. Extreme relaxation of abdominal walls; no resistance; fingers can be passed everywhere to the spine. Three fingers can be passed under costal margin over liver nearly 6 cm. The edge of the liver can be felt in its whole extent, and the fingers can be thrust almost as far under it. The bladder could be felt as a firm ovoid body, reaching almost to the navel.

Spleen can be felt on deep pressure. Both kidneys can be felt.

He cannot raise himself off the bed without turning over. As he makes the attempt the abdomen is thrust forward and slight contraction is seen of the expanded abdominal muscles and recti.

The deformity of the thorax is very remarkable. Harrison's grooves are unusually marked, corresponding to the 6th costal cartilage. The lower portion of sternum is thrust forward, forming almost a right angle with the xiphoid cartilage. As shown in the photograph it is remarkably prominent, and is fully 3 cm. above the level of the skin in the intercostal furrows.

There is a condition of cryptorchidismus. The testes are not to be felt in the groins.

Remarks.—These cases illustrate a very remarkable form of congenital defect. The deficiency in the abdominal muscles, and the high position of the bladder are associated conditions due to arrest of development. We could not say definitely in my case whether the bladder was adherent to the umbilical scar. Dr. Guthrie regarded the hypertrophy of the bladder and the dilatation of the ureters as secondary, due to the fact that in his case, being firmly connected with the umbilical scar, it was unable to contract downward and to empty itself completely. In its effort to do so it became hyper-

trophied and dilated, and the accumulation of urine caused [333] backward pressure and dilatation of ureters.

In reply to a question, Dr. Bardeen, one of Prof. Mall's associates in the Anatomical Laboratory of the Johns Hopkins University, who has been specially engaged in a study upon the development of the muscles, writes as follows: "Two possibilities suggest themselves to me in the case:

"1. It is possible that the lack of resistance normally met with in the abdominal wall by the bladder at the time the kidneys begin to secrete urine may cause the bladder to expand rather than to empty secretions into the amniotic cavity through the urethra.

"2. Under normal conditions the growth of the abdominal musculature into the *membrana reuniens*, the early covering of the abdominal cavity, is preceded by the formation of a vascular plexus supplied from above by the internal mammary, from below by the epigastric artery. It is possible that an abnormal arrangement of the blood vessels in the embryo prevented the formation of this plexus, and impeded the growth of the abdominal musculature, and that at the same time circulating disturbances gave rise to the abnormal conditions found in the bladder and ureters."

INTERMITTENT CLAUDICATION.

BY

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Professor of Medicine, Johns Hopkins, University.

Reprinted from the Montreal Medical Journal, February, 1902.

INTERMITTENT CLAUDICATION.

BY

WILLIAM OSLER, M.D., F.R.S.,

Professor of Medicine, Johns Hopkins University.

In 1877 or 1878, when studying comparative pathology, I went one day to the country with some of the members of the Montreal Veterinary College to see an autopsy on a horse which had had a peculiar form of intermittent lameness. Dr. McEachran said the condition was well recognized, and had been described by the French writers, but it was very obscure. I have forgotten now the details of the autopsy, except that we found verminous aneurisms of many of the mesenteric vessels and of the iliac arteries. At the time I was much interested, and looked up Bouley's paper on *Claudication Intermittente*. He described an affection in the horse, in which, after being driven for fifteen or twenty minutes, the animal stopped, one or both of the hind legs got stiff, and soon it was unable to stir. In from half an hour to an hour it recovered and was able to go on comfortably for another fifteen minutes, when the attack recurred. In such cases, post-mortem, the artery of the affected limb was found blocked with a clot, or, when both hind legs have been involved, the abdominal aorta contained thrombi.

The subject was not brought to my attention again until a few years ago, when working at the subject of angina pectoris. I then looked up Charcot's description of this intermittent claudication in man, and made also the interesting discovery that Allan Burns in his *Observations on Some of the Most Frequent and Important Diseases of the Heart, 1809*, had given an explanation of this remarkable phenomenon.

One or two of his sentences I may quote: "In health, when we excite the muscular system to more energetic action than usual, we increase the circulation in every part, so that to support this increased action the heart and every other part has its power augmented. If, however, we call into vigorous action a limb round which we have with a moderate degree of tightness applied a ligature, we find that then the member can only support its action for a very short time, for now its supply of energy and its expenditure do not balance each other; consequently, it soon, from a deficiency of nervous influence and arterial blood, fails and sinks into a state of quiescence." He puts it very tersely when he says, "the supply of energy and expenditure do not balance each other."

Charcot was the first to describe a condition in man identical with that met with in the horse. His Memoir was presented to the *Société de Biologie* in 1856, and is also to be found in the *Leçons du Mardi, I.* One day a patient in the service told him that he was not able to walk for more than a quarter of an hour without being taken with cramps in the legs. After resting a while he would get better, and would be able to resume his walking, and then a crisis recurred. At the autopsy Charcot found a ball encysted in the neighbourhood of the iliac artery, and a traumatic aneurysm which had obliterated the artery in its lower part. The circulation was carried on by collateral channels, which were ample to maintain the nutrition while the patient was quiet, and for a short period during exertion, but after a time, when the limbs were fatigued by the movements, the quantity of blood which reached them was insufficient, causing a relative ischæmia, with tingling, cramps, and impossibility of walking. He refers to the fact that the condition is often preliminary to gangrene, and narrates a case in which a patient with the affection had his leg amputated for gangrene.

Interest has been reawakened in the subject by the very careful studies of Erb (*Deutsche Zeitschrift für Nervenheilkunde*, 13), in which he has reported twelve cases, and has called attention particularly to its association with arterio-sclerosis and calcification of the arteries of the legs. The whole subject, too, has been reviewed this year (1901) by Goldflam in the *Neurologisches Centralblatt*, and in this country cases have been reported by Gordon (*New York Medical Journal*, 1900), and by Riesman (*American Medicine*, 1901).

Familiar as I had been for years with the disease in the horse and with the early literature on the subject in Burns' work and with Charcot's description, I had never recognized the condition clinically until in the patients whose histories I here give.

Case I. *Vomiting and pain in abdomen—Pulsating tumor in epigastric region—History of syphilis—General arterio-sclerosis—Wiring and electrolysis of aneurismal sac—Marked improvement—Return in nine months with well marked intermittent claudication.**

W. B., aged 31, from Virginia, came first to the hospital in December, 1899, complaining of vomiting and great pain in the upper abdomen. These symptoms had been present for several months. He had lost in weight and had become very nervous. He had been a healthy fellow, but had had syphilis six or seven years before. The radials were sclerotic, the aortic second sound ringing and accentuated, and in the epigastric region there was a wide area of impulse; on palpation an expansile tumor which could be easily grasped in the hand. I urged him to have the sac wired. To this he consented and went home to settle his affairs. He returned early in January, and Dr. Finnie opened the abdomen and found an aneurism of the abdominal aorta, into which he inserted ten feet of wire, through which he passed an electric current for an hour. The patient did well and returned to his home very greatly benefited, particularly in the relief of the pain. He returned in October, 1900, for examination. He had continued free from pain and vomiting. His general condition was excellent, though he was still nervous and apprehensive. The sac was decidedly smaller and the area of pulsation much less.

He volunteered the statement that there was an additional symptom which had disturbed him not a little; namely, after walking for a certain distance his legs would, as he expressed it, give out completely; so that he could not move another step, and had to sit down. After resting a few minutes he could then go on again. This was more particularly noticeable when he walked on the street. He had to go very slowly and could not go for any distance. There was no paralysis accompanying the loss of ability to walk. He could move his legs, but there was an uncontrollable feeling that he could not take another step. Accompanying this there was a sensation of dead, heavy weight in the legs, but no cramps. Walking about in the house (and in the yard) did not bring on the condition, but he had had it very frequently in the past few months, and he had learned to ward it off by walking very cautiously and slowly and resting at intervals. The femoral arteries and the dorsal arteries of the feet were distinctly sclerotic.

* As I look over this paper for the press this patient has been readmitted to the hospital (January, 1902). He has remained very well since the operation two years ago. The aneurism can be felt. It is hard and firm. He has no pain, but is still very neurasthenic. He has not had the intermittent claudication for nearly a year.

In aneurism of the abdominal aorta the condition is the same as that which produces the intermittent claudication in the horse, and one can readily understand how, as Allan Burns expressed it, the supply of energy and expenditure did not balance each other. In fact, it is surprising that lameness is not more common in such cases.

The following case is a typical illustration of the more frequent cause; namely, general arterio-sclerosis. The patient had, moreover, the associated vaso-motor and nervous disturbances which are not uncommon with disease of the arteries of the extremities.

Case II. Mitral stenosis—General arterio-sclerosis—Attacks of intermittent lameness with numbness and tingling in the feet and marked vaso-motor disturbances—Absence of pulsation in the dorsal arteries of the feet.

Mrs. W., aged 55, admitted June 7th, 1900, complaining of pains in the right leg, difficulty in walking, and heart trouble. There was nothing of any special moment in her family history. Her mother died of tuberculosis, and probably one sister. She had had the usual diseases of childhood, and had acute articular rheumatism at sixteen. She had had seven children and five miscarriages. The last child was born seven years ago. She had always enjoyed good health, and had had no serious illnesses. She said, however, that she had had heart trouble all her life, and occasional attacks of shortness of breath.

Present Illness. While at Baden last August she went out for a walk after eating a very hearty dinner, and after going a little distance from the hotel she lost control of her legs. There was no pain, but they simply refused to carry her, and she had to be carried back to the hotel. There was no loss of consciousness. She was very much alarmed about herself, and she was given aromatic spirits of ammonia, which made her very nauseated, and a little while later she vomited. The following day she felt well enough to leave Baden. Prior to this time she had begun to suffer a good deal with dyspnoea on exertion. She stood the journey back to this country very well, and remained quite well until about six weeks ago. Walking rapidly one day to the boat at Norfolk, she got somewhat out of breath. She got on the boat all right, and felt quite well until she reached Fortress Monroe, when she found on attempting to get up she was unable to walk. She had at this time a feeling of pins and needles in her feet, chiefly in the right foot. There was no difference in the color, and no swelling. About three weeks ago it was noticed for the first time that the right foot and leg were slightly blue, and she has had a good deal of pain in this foot and leg, sometimes sufficient to require

morphia. For the greater part of the time since the attack she has been in bed. On attempting to move about the legs give way. The pain in the right leg is much intensified if the foot hangs down. She has been very much worried and disturbed about herself, but her general health has been pretty good. She does not think she has been more short of breath of late. She has had a little palpitation and pain about the heart. The dyspnoea is altogether on exertion.

Present Condition. The patient was a medium sized woman, quite stout and looked nervous. The tongue was clean. She gave a very good account of her history and condition. The radial pulse was regular, 96, vessel wall not sclerotic. No sclerosis of the temporal arteries. The pupils were equal, and reacted to light and on accommodation.

Heart. Point of maximum impulse was visible in the fifth interspace about the nipple line. There was an exaggerated systolic impulse on palpation; no definite thrill. On auscultation there was an extremely sharp, flapping first sound at the apex, almost amphoric in tone, and preceded by a short, rumbling murmur. There was a soft systolic bruit at the aortic area, and the second pulmonic sound was loudly accentuated.

The abdomen was not swollen; liver and spleen not enlarged.

Legs. Both could be moved freely in bed. Power of movement of right toes and ankle slightly impaired. The right leg looked cyanosed from the knee down. There was no œdema. It was extremely tender to the touch. The right calf measured the same as the left— $31\frac{1}{2}$ cm. Left leg and foot normal in size and color, and not tender to the touch. Both feet felt cold, the right more so than the left, and she complained very much of the numbness in them. There was no pulsation to be felt in the dorsal artery of the right foot, nor in the right popliteal artery. Slight pulsation to be felt in the femoral artery. No pulsation in the dorsalis pedis or popliteal arteries of the left leg. Pulsation in the left femoral was well felt. Pulsation in the external iliacs could be just felt. There were no patellar reflexes in either leg, and the plantar reflexes were very difficult to obtain as she winced so much from tenderness of the soles.

The patient had warmth applied to the legs, careful friction, and she did remarkably well. On the 11th there was no cyanosis in either the leg or foot. It was still cooler to the touch and tender. No pulsation could be felt in the femoral artery.

I heard subsequently from this patient's daughter that she died a month or two after leaving the hospital.

This case illustrated the good effects of careful treatment as recom-

mended by Erb. With rest in bed, warmth to the legs and careful friction she improved very much. She received great benefit too from the use of full doses of nitroglycerine.

A word as to the name. I think it is very much better to use the term intermittent claudication, though it does not specify the etiology. It expresses well the most characteristic feature of the complaint. Erb's term, *intermittirendes Hinken*, is simply the German equivalent. Other terms have been used, such as *angio-sclerotic intermittent dysbasia* by Charcot, *intermittent muscle paresis* by Erb, and *angio-sclerotic paroxysmal myasthenia* by Higier, the author of a long article on this subject in *Deutsche Zeitschrift für Nervenheilkunde*, July, 1901. As shown in the horse and in the first case which I here report, the affection is not always due to simple arterio-sclerosis, but may be due to aneurism, as in Charcot's case and as in the rule in the horse. Oppenheim has reported instances in nervous individuals in which the condition seems to depend upon vaso-motor disturbances.

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ON THE DIAGNOSIS OF BILATERAL CYSTIC KIDNEY.

BY

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The condition of bilateral cystic kidney is more often recognized at autopsy or discovered by the surgeon than diagnosed during life by the physician. In Montreal and Philadelphia I had dissected four cases of the kind in children or in adults, and it always seemed to me that the cases presented clinical features distinctive enough to enable one to make the diagnosis during life. Yet this, I believe, is very seldom done. Of the two cases which have been in my wards in the Johns Hopkins Hospital, in one the diagnosis was easily made.

CASE I.—A. W. N., male, aged 59, admitted October 3, 1893, with dyspnea. He had been a hard worker, with no history of any special excesses. He had been ill on and off for 10 years, chiefly with dyspnea and recurring attacks of shortness of breath. These had increased of late very rapidly, so that he had become incapacitated for work.

On admission he was orthopneic and cyanosed, with a rapid, feeble pulse. The heart was dilated and the impulse feeble and diffuse. On auscultation there was a gallop rhythm, but no murmur. There was marked sclerosis of the superficial vessels, and the case was thought to be one of general arteriosclerosis with secondary hypertrophy and dilation of the heart. The abdomen was enlarged and tense. The liver was greatly enlarged, reaching nearly to the navel. The spleen could not be felt. There was no note whether or not the kidneys were palpable. The abdomen was so distended and the liver was so large that it is quite possible they might not have been felt. The urine had a specific gravity of 1.016, a slight trace of albumin, and numerous granular casts; no blood. He had no history of hematuria.

For a week he remained in very much the same condition, with a marked gallop rhythm and shortness of breath, and signs of beginning effusion in the chest and abdomen. On the thirteenth he died suddenly.

Autopsy, No. 461.—There were found marked hypertrophy and dilation of the heart, general arteriosclerosis and emphysema. The kidneys were greatly enlarged, measuring 21 by 11 cm. They were universally cystic, the cysts ranging in size from a pea to an egg, containing clear yellow, and in some places turbid, material. There was no dilation in either pelvis, and the ureters were normal.

CASE II.—Florence S., aged 28 (Med. No. 9,479), admitted

January 21. Her parents were dead. She had one sister and two brothers, living and well. She had one sister, aged 30, who had had, so the doctor said, hemorrhages from the kidney. There was no history of tuberculosis in the family.

She had never had any serious illness. Nine years before she had chills and fever for a couple of weeks. She had always enjoyed good health. For three or four years she had been troubled with headaches, chiefly frontal. Once she had bleeding from the nose. She had had no shortness of breath. As a child and young girl, she took part in games without any trouble. Appetite and digestion had been very good. The abdomen had never been swollen. She did not have to rise at night to micturate; no increase in frequency during the day. Her menstruation had been regular. She had always had a somewhat sallow complexion.

Present Illness.—About a year ago patient noticed that for nearly a week the urine was of a blood-red color. There was no pain, no fever, no chills. She did not go to bed, and did not stop work. She had no further trouble until Monday, December 6, when at 10 p. m. she had a severe attack of pain in the right side, which was very sharp, and lasted until 3 o'clock the next day. She did not have a chill, and does not think she was feverish. The doctor thought she was passing a gallstone. The day previous to this attack she noticed that the urine was bloody; and it remained so for nearly two weeks. She did not notice that there were any clots in the urine. She remained in bed for nearly three weeks on account of the prostration and weakness following the loss of blood. The pain in the left side persisted at intervals, coming on in paroxysms. She thinks she was yellow for some days at this time. On December 6, she noticed for the first time that there was some distention of the abdomen, and she thinks that for some time she had felt the waistband to be tight. Since the attack there had been increasing frequency in micturition during the day, sometimes every hour and a half. She did not think that she passed more urine at one time than at another. She had not had headaches for nearly a month before the attack. When the pain was very severe she had vomiting with it. The week after she got out of bed, she noticed that her feet were a little swollen, and that the eyelids were puffy. The bowels had been regular.

Condition on Admission.—She was a healthy looking, well nourished woman, skin rather sallow, mucous membranes a little pale, no edema. The pupils were equal. The pulse was 76, of good volume, tension plus. The radials and temporals were sclerotic. The thorax was well formed, expansion good; the lower left axillary region appeared fuller than the right.

There was slight general pulsation over precordia. In fifth interspace the impulse could be felt in the anterior axillary line. The point of maximum impulse was in the fourth interspace, 9 cm. from the midsternal line. The relative cardiac dullness began at the upper margin of the third rib, did not pass to right of midsternal line, and at the fourth rib extended $8\frac{1}{2}$ cm. from the midsternal line. There was a soft systolic murmur at the apex. The second sound was sharply accentuated. The diastolic shock was well felt.

Abdomen.—The skin of the lower part of the thorax and abdomen generally was decidedly more pigmented than the other parts of the body. There was fulness in both flanks, more in the right than in the left. The respiratory movements were slightly diminished; no peristalsis. The right flank was

occupied by a large tumor which could be grasped between the hands, and which descended slightly with deep inspiration. It was a little irregular on the surface, not at all sensitive. In the left flank a second tumor could be made out, feeling rather larger and fuller than the one in the right. It reached a point $3\frac{1}{2}$ cm. to the left of the middle line, and below to about 3 cm. above the crest of the ilium. It was irregular, and presented numerous nodular bodies on the surface. It felt much more superficial than the tumor on the right side. It descended very slightly with inspiration. The percussion note over both tumors had a dull tympany. Both tumors became much more prominent and could be much more readily felt when the patient assumed the knee-chest position. The spleen was not palpable. The liver flatness began on the middle of the sixth rib in the parasternal line, and extended to the costal border. The gallbladder could not be felt.

Blood.—Red blood-corpuscles, 2,400,000; hemoglobin, 40%; leukocytes 6,000.

Urine.—On admission 900 cc., straw-colored, specific gravity 1,007, distinctly acid, slight trace of albumin; the catheterized specimen after centrifugalization showed a few red blood-corpuscles, no casts. Urea, 7.2 grams. A daily analysis was made of the urine during her stay in hospital. The specific gravity was persistently low. In the 19 examinations of the urine made during her stay, in only one did the specific gravity reach 1,009, usually it was 1,007 and 1,008. There was always a slight trace of albumin, and as a rule a few red blood-corpuscles. Once, on February 6, a hyaline cast was seen. An exceedingly interesting point was that on February 5, cholesterin crystals were seen in the urine. The amount of urine rarely reached above one liter; on February 2, she passed three liters. The urea ranged from between 5 and 6 grams the lowest, to 19 grams the highest. She had no fever.

A diagnosis of bilateral cystic kidney was made on the basis of the presence of the tumors in the flanks, recurring hematuria, with the cardiovascular and urinary changes of a sclerosis of the kidneys. The patient left the hospital February 11, 1899, feeling very comfortable.

She was readmitted on February 27, 1900, in a condition of urgent dyspnea. From her friends it was learned that she had remained well and had been at work. She had at times passed bloody urine. For four days she had only been able to speak in a whisper, and had great difficulty in getting her breath. She said that it hurt her when she swallowed, and the trouble was altogether in the throat. She had frequently had attacks of vomiting, and on the morning of admission spat up thick blood clots. She had no fever, no chills.

The patient was in great distress, and it was rather difficult to get an answer. When admitted she was breathing 20 to the minute, very labored and loud and noisy. The *alæ nasi* were dilated, and all the accessory muscles of respiration were in action. The heart's impulse was visible and forcible. She had a very bad night and became cyanosed. The thorax was clear. There was nothing to be seen on careful examination. Examination of the throat showed a few small patches of exudate, but there were no diphtheria bacilli in smears, and subsequently none grew on the cultures. At 6 p. m., on February 28, she became so cyanosed, and there was such distress that Dr. Baer performed tracheotomy. The difficulty in respiration was not at all relieved; the respirations were as full and labored,

and there was the same retraction of the lower sternum and interspaces. The tube was perfectly clear, and a large volume of air passed in and out, apparently without obstruction. As it was thought that possibly she might have laryngeal diphtheria, antitoxin had previously been given.

She sank gradually and died at 5 a.m. on March 1. The urine examined during this admission showed a specific gravity of 1.013, many red blood-corpuscles, no casts, urea 3 grams to the liter. The examination of the abdomen showed the presence of 2 large tumor masses, and Dr. Fletcher thought that the left had increased in size, and in comparison with the charts previously made it evidently had increased a good deal.

Autopsy No. 1,498, performed by Dr. McCallum: Before opening the abdomen a mass was felt on the left side extending to the level of the crest of the ilium, and centrally to within 2 fingers' breadth of the navel. On the right side the mass was not so large, but it could be felt in the right hypochondriac and in the right epigastric region.

The abdomen was opened with a crucial incision. The stomach was vertically placed and the lesser curvature made an acute angle reaching nearly as low as the navel. The edge of the left lobe of the liver reached 8 cm. below the costal margin. The cecum bulged in the right iliac fossa. The transverse colon was below the level of the navel, and had a pear-shaped fold reaching to the pubes. Neither kidney could be seen. On lifting the splenic flexure of the colon an enormous cystic kidney was seen. The cysts were plainly seen through the peritoneum. On the right side the hepatic flexure of the colon turned directly over the kidney and was attached to the duodenum. When the intestines were turned to the right the lower end of the left kidney was seen to extend to within 3 cm. of the promontory of the sacrum. The relations of the duodenum to the kidneys were interesting. On the right the first portion of the duodenum lay directly upon the cystic kidney. The terminal portion of the duodenum was in direct contact with the left kidney for 6 cm.

The left kidney was 22.5 cm. long by 9.5 cm. wide, and reached above to the sixth interspace in the mammary line. The pancreas lay directly over it for most of its length. The spleen was above it, but was not adherent. The organ consisted of a congeries of cysts, some with clear, others with dark-colored contents. It weighed 1,400 grams. The ureter was normal. The upper end was formed of one large cyst nearly 9 cm. in diameter.

The right kidney was 16 by 9.5 cm. and reached upward to the level of the seventh interspace in the nipple line. It weighed only 950 grams. It had the same contents. The mucosa of the pelvis and ureters was normal.

There was marked hypertrophy of the heart and general arteriosclerosis.

These two cases illustrate very well the general features of polycystic kidney, and one of them the facility with which the diagnosis can be made in the presence of a characteristic combination of symptoms. These are: First, the presence of bilateral tumors in the flanks. Polycystic kidney is rarely unilateral. Of the 88 cases collected by James Ritchie (Laboratory Reports,

Royal College of Physicians, Vol. IV), in all of the cases except two both kidneys were involved. Of the 62 cases tabulated by Lejars only one was unilateral. The tumors are often unequal in size, as in Case II here reported. There is no difficulty in recognizing that the tumors are renal. In Florence S. the tumors could be readily grasped bimanually, and the situation and mobility left no question at all that they were enlarged kidneys. This circumstance alone should at once arouse suspicion, as other forms of bilateral renal tumor are excessively rare.

Secondly, the cardiovascular changes of interstitial nephritis. In Case II these were very pronounced—the sclerosis of the arteries, the dislocation of the apex beat to the left and the accentuation of the aortic second sound.

Thirdly, the condition of the urine, which is that of advanced interstitial nephritis. In Case II it was very characteristic—the low specific gravity, the slight trace of albumin, a few red blood-corpuscles and scanty tube-casts. An exceedingly interesting feature in her case, which I do not see mentioned, was the presence of cholesterolin crystals in the urine.

Fourthly, hematuria, which in Case II had recurred in attacks for more than a year. It was present in 19 out of 78 cases (Morris). It may recur in paroxysms, as in Case II, and be associated with much pain.

While the local symptoms, such as pain and tumor, may be well marked, it is the cardiovascular, gastric and pulmonary features of interstitial nephritis which attract attention. That the diagnosis has been made so rarely, in only 5 out of 62 cases, according to Lejars (quoted by Morris) is owing to the fact that the patients are seen (as was Case I) with signs of cardiac insufficiency and dyspnea, and no attention is directed to the kidneys; or they are attacked with sudden coma or uremia. Once the attention of the physician is called to the characteristic combination of symptoms, the diagnosis is very readily made.

In these operative days the question of diagnosis has a very practical aspect. At a medical society I saw a surgeon exhibit a very large cystic kidney, which he had just removed. I asked whether the other kidney had been examined, as the condition was almost always bilateral, and he replied that he had not had his attention called to it. The patient died in a few days with symptoms of uremia. As a rule, in polycystic disease

operation is contraindicated, since removal of one kidney simply takes away one-half of the already reduced kidney tissue available for excretory purposes. Even in unilateral cases it is stated that the remaining kidney may become cystic after a few months. Mr. Henry Morris, in his recent treatise on *Surgical Diseases of the Kidney and Ureter*, states that he has operated on three cases of unilateral disease, and in two of them the patients were alive and well several years after, and he states that "when the opposite kidney has been ascertained, either by inspection or palpation, to be unaffected, we are not justified, in my opinion, in refusing a patient the relief from severe pain or hemorrhage, or from the dangers of infection from suppuration of the cysts, which nephrectomy affords."

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**ON AMEBIC ABSCESS OF THE
LIVER.**

BY

WILLIAM OSLER, M.D.,

OF BALTIMORE.

FROM

THE MEDICAL NEWS,

NEW YORK,

APRIL 12, 1902.

ON AMEBIC ABSCESS OF THE LIVER.¹

BY WILLIAM OSLER, M.D.,

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By far the most frequent form of abscess of the liver met with in this locality is that which is secondary to the amebic dysentery of which it is by far the most frequent and serious complication. The relative frequency may be judged from the fact that of some 93 cases of amebic dysentery which have been admitted to the wards, abscess of the liver occurred in 23 as a complication. Naturally this very high percentage is owing to the fact that only the more serious cases are admitted, and a considerable number of these, of course, come into the hospital for the hepatic symptoms and not for the dysentery.

Within the past three or four months we have had a rather unusual series of five (possibly six) cases, illustrating many interesting points in the clinical history of abscess of the liver. You have had many opportunities of studying these cases, and I purpose this morning to review their histories in order that I may impress upon you the chief features.

Case I.—Clinical Summary. No history of dysentery. Illness of four weeks' duration. Pain in the right side. Swelling over the sixth and seventh ribs. No enlargement of the liver. Remarkable persistent cyanosis. Operation. Opening and draining of an abscess of the liver. Recovery.

The patient, Thos. E., aged thirty-two years,

¹ A Clinical Lecture delivered at the Johns Hopkins Hospital, Feb. 15, 1902.

admitted Oct. 18, 1901, had been a healthy man, with a good history. He had not had dysentery. He entered the hospital complaining of pain in the right side below the ribs. His illness had begun four weeks before admission with a chill, followed four days later by pain in the right side, not severe enough to make him take to bed. This pain had gradually increased, and was most intense beneath the lower ribs on the right side; it was especially severe after eating and frequently radiated to the shoulder. Shortly after the onset of his illness he began to notice that he passed mucus in the stools, but there was no blood, and he had only one or two movements in the twenty-four hours. He had several slight night-sweats; no chills, no jaundice. His appetite and digestion were good, and the patient felt well except for the pain and a sense of weakness. One remarkable feature in his case was the diffuse cyanosis, a general blueness of his face and hands which he had noted about two weeks after the onset of his illness. On admission this lividity was very striking. On the right side over the sixth and seventh ribs there was a swelling between the parasternal and midaxillary lines. There was no redness and no heat over it. There was tenderness on light palpation, and on deep palpation it gave a boggy sensation. The right costal margin was a little more prominent than the left, and the right rectus was held a little tense. The liver flatness began at the fifth rib and extended two centimeters below the costal border. The edge could not be felt. The spleen was not palpable. Examination of the other organs was negative. The stools showed no amebæ. The leucocytes were 6,825 per cubic millimeter. An extraordinary feature was the general diffuse cyanosis. He constantly looked as if he had just come out of a cold tub. The

hand forcibly pressed upon the skin of the chest or back left an area of anemia which was very slowly obliterated. His temperature was normal. He was under observation until November 11th, and, with the exception of the swelling over the sixth and seventh ribs and a slight pain, there were no symptoms. The liver was not enlarged and there was no tenderness on deep pressure over the liver, either in the axillary region or at the tip of the tenth rib. The intercostal

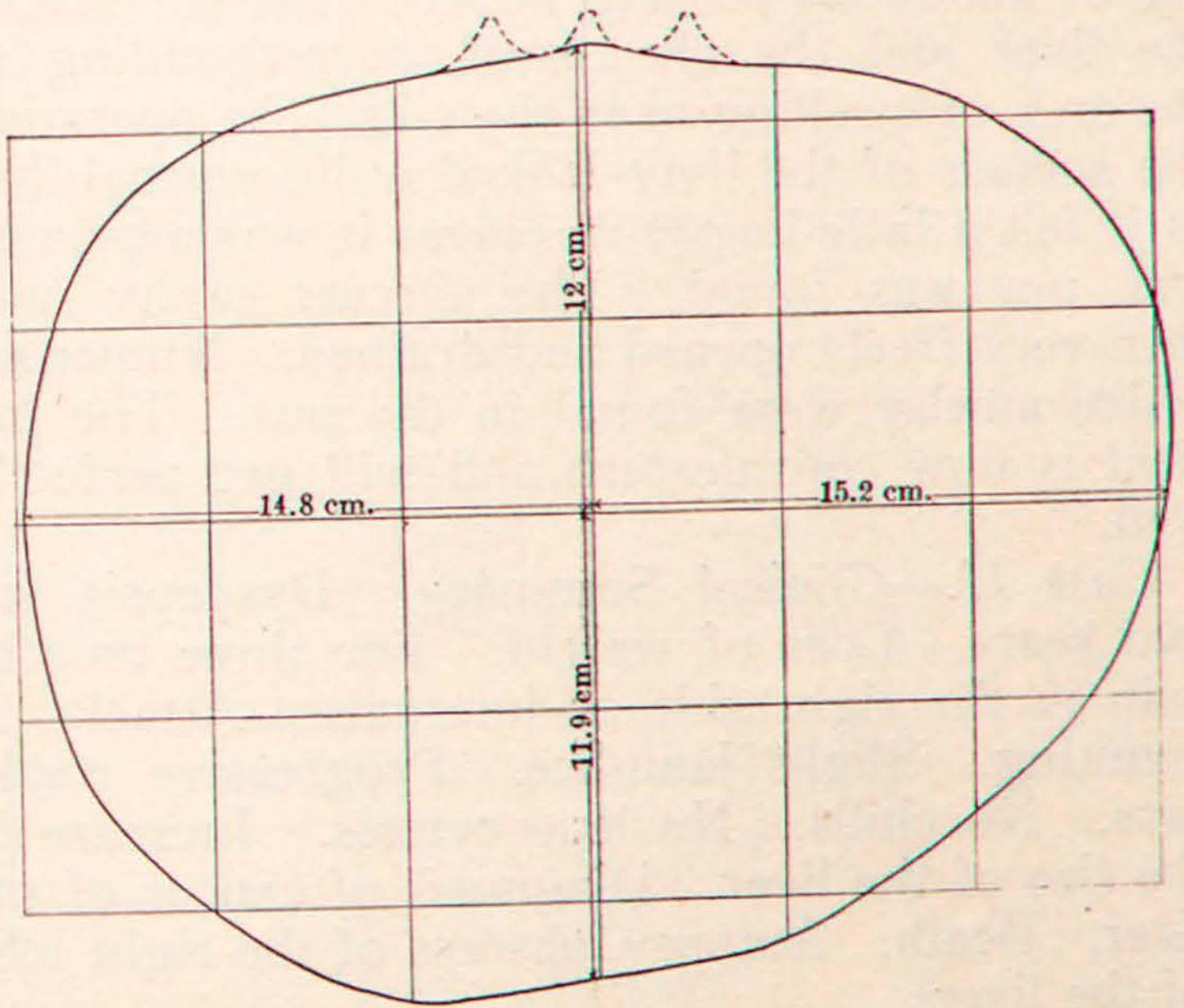


Chart 1. Cyrtometric tracing in Case III., showing the enlargement of the right half of the thorax.

spaces on this side were not obliterated. The swelling persisted, but did not increase. It was particularly to be noted that his temperature was normal; he had no chills; there was no leucocytosis. On the night of November 6th he had a heavy sweat. I discussed the case frequently with Dr. Halsted, and I must say we could not arrive at a positive diagnosis. I inclined to the

view that he had necrosis of the ribs from some cause, and, though the diagnosis of abscess of the liver was suggested, the negative character of the symptoms rather pointed against it. The leucocytosis on the 7th rose to 11,000, and he was transferred to the surgical side.

On the 11th Dr. Halsted operated, and found that there was only an area of infiltrated tissue over the region of the swelling; there was no necrosis of the ribs, but there was a remarkable tag of adhesions passing between the surface of the liver and the chest-wall, corresponding to the area of swelling over the ribs. At operation the surface of the liver looked quite normal, but as it felt a little boggy in places it was aspirated and pus was found. The abscess cavity was then very freely opened and drained. Numerous active amebæ were found in the pus. The patient is now convalescent and will get perfectly well.

Case II.—Clinical Summary. Dyspepsia for two years. Loss of weight. For three months pain in the right side at intervals. Attacks of vomiting. Slight jaundice. Progressive weakness. No chills. No leucocytosis. Increase in the size of the liver. Diagnosis of cancer of the liver. Death. Autopsy, abscess of the right lobe of the liver.

Amelia B., aged sixty-four years, admitted November 11th, complaining of pain in the right side. For many years she had had dyspepsia and had been very nervous. For two years she had been losing in weight. Her present illness began thirteen weeks before admission, with a sudden severe pain in the right side, which lasted for two days and then subsided; she has had it at intervals ever since, particularly with nocturnal exacerbations; it is usually in the lower part of the right side and radiates to the front of the

abdomen, never to the shoulder. She has had frequent attacks of vomiting, particularly at night when the pain is worse. The bowels have been constipated, except at the onset of the illness, when she passed a little blood in the stools. She has grown progressively weaker and has lost in weight. During the past few weeks she has

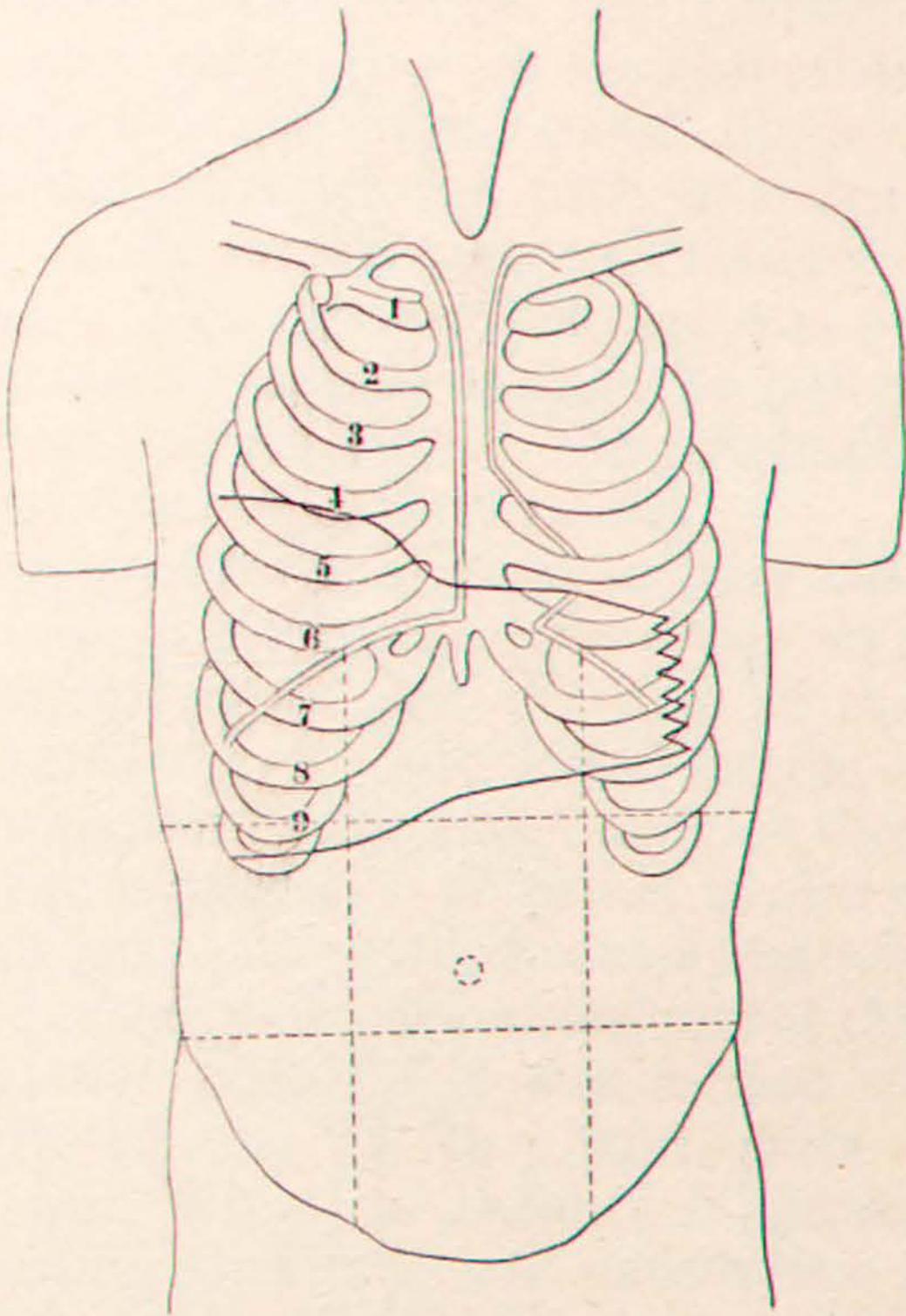


Chart 2. Showing the upward enlargement of right lobe in Case III.

become slightly jaundiced. The abdomen was full and large; there was tenderness below the right costal border; no special tenderness over the gall-bladder, but deep under the costal margin there was a firm hard mass to be felt, which descended with inspiration. The edge of the liver could be felt all along the costal border. She

had no fever and the leucocyte-count was only 10,000. The stools were clay-colored. They were not examined at the time for amebæ, as there was no suspicion of abscess. She remained in the hospital two weeks and improved very much; she was afebrile throughout and was discharged very much better on November 26th.

She returned on December 30th, complaining

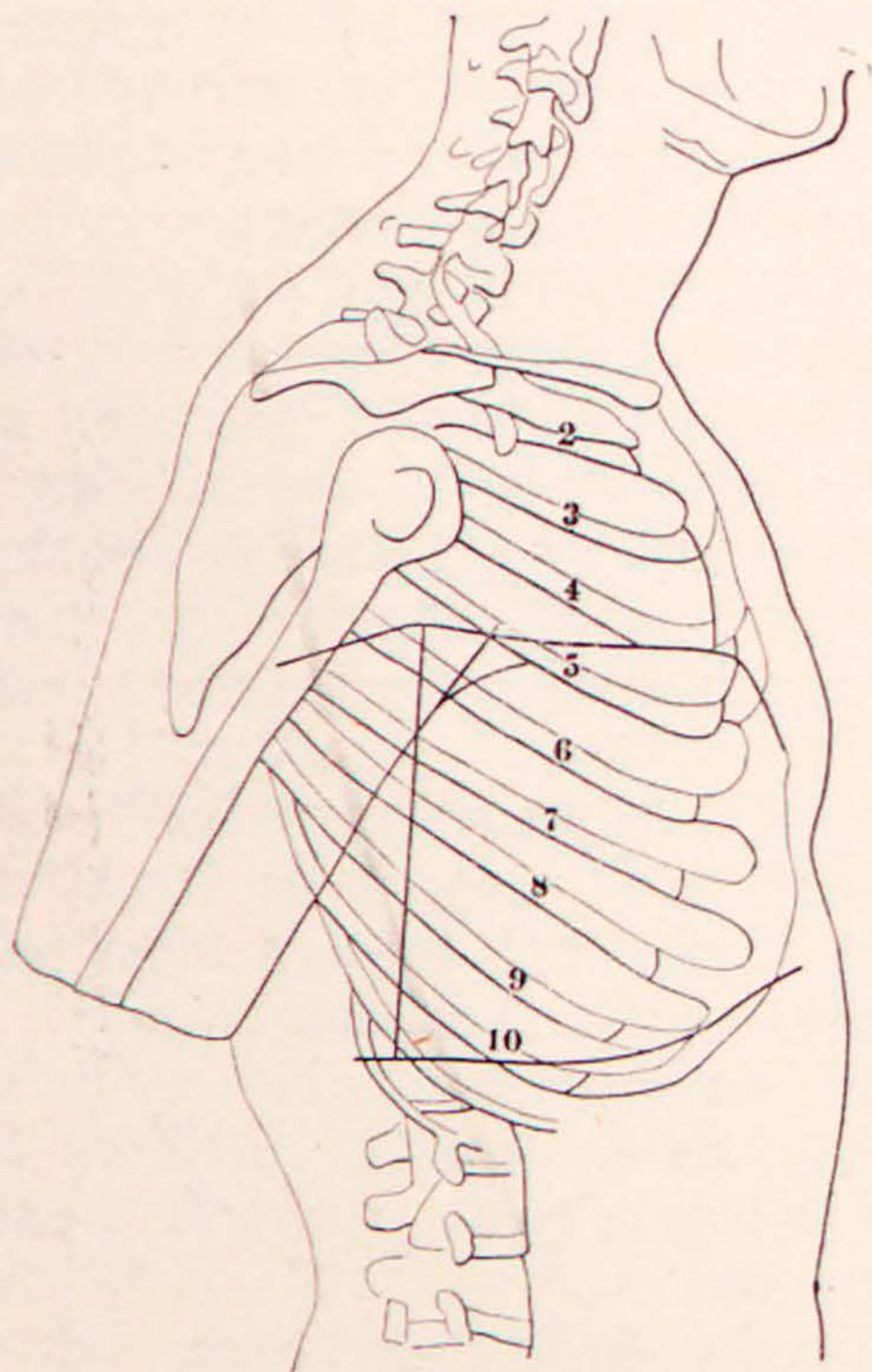


Chart 3. Showing the high limit of liver dulness in Case III.

of a great increase in the pain in the side, particularly on movement. She had a great deal of nausea, vomiting and insomnia. She was sallow, but not jaundiced. The edge of the liver could be felt three finger-breadths below the costal border, and there was irregularity of the

edge. During the month she was under observation she had slight fever, ranging occasionally to 101° F.; usually it was not above 99° F. She had no chills, no diarrhea; the stools were clay-colored; no bloody mucus. There was a trace of bile in the urine. The leucocytes were only 8,800. The liver gradually increased in size. The abdomen was difficult to palpate, as it was full and large, but a nodular mass was made out below the right costal border. The liver flatness began at the fifth interspace, and gradually, as the liver increased, extended almost to the navel. The pain in this case was peculiar. Any movement caused it, and the patient suffered a great deal at night. She gradually grew weaker and died on February 2d.

The autopsy showed a large, solitary abscess of the right lobe of the liver. There was no ulceration in the intestines. At the time of the post-mortem, amebæ were not found in the superficial examination of the pus, but later they were seen in large numbers in a section of the wall of the liver abscess. We had no suspicion whatever in this case of the existence of abscess of the liver. I thought that possibly it was a case of gall-stones with cancer, as the pain came on so suddenly, but, while no definite diagnosis was reached, strong suspicion was entertained that it was cancer of the liver. The organ increased rapidly in size. There were no chills, no sweats and no leucocytosis, and the pain was not greater than one sees sometimes in rapidly-growing carcinoma.

Case III.—Clinical Summary. Dysentery five months before admission. Gradual improvement. Recurrence. No chills. Progressive weakness. Amebæ found in the stools. Characteristic signs of abscess of the liver. Litten's sign in the fifth

interspace. Operation refused. Discharge. Rupture of abscess into lung. Death.

Joseph S., aged twenty-nine years, admitted December 9, 1901, complaining of trouble in the abdomen. He had been a healthy man, an Austrian, who had lived in this country for seven years. He had been a sailor and had been on repeated cruises. He had not been out of Maryland for four years. Five months ago he had had a severe attack of dysentery which was very severe for three or four days and had continued ever since. He was treated in Brooklyn, N. Y., for typhomalaria, and subsequently, by another doctor, for spinal disease. He had been getting progressively weaker. His dysentery improved and for some time he was constipated. Two weeks ago he began again to have diarrhea and passed some mucus. He had had no chills.

On admission the patient looked ill and pale. His temperature was normal, but rose to 101.5° F. in the evening. The thorax was asymmetrical, bulging on the lower right side, as shown very well in the accompanying cyrtometric tracing (Chart I.). The liver was enlarged and there was a marked fulness in the epigastric and right hypochondriac regions. There was nowhere any tenderness. The liver could be seen descending with inspiration. Charts II. and III. (outlined by Dr. McCrae) show very well the interesting increase in the area of liver flatness. The measurements were 17 cm. in the nipple line, $16\frac{1}{2}$ cm. in the parasternal line, 16 cm. in the mid-axillary line. The left limit of liver flatness was somewhat doubtful. One point of very great interest was a very definite Litten's diaphragm phenomenon in the fifth interspace. Never do I remember having seen the diaphragm phenomenon so high, and it was almost evident from it alone that the bulging and fulness were not due

to empyema. In the mucus of the soft stools amebæ coli were found.

On the following day the patient was aspirated and a creamy, glutinous pus obtained, chiefly made up of granular debris and a few cells looking not unlike liver cells. No amebæ were found in it. In this case too the leucocytes on the 9th were only 9,000, and on the 10th practically the same, red blood corpuscles 4,500,000, hemoglobin 51. He had not a particularly septic look, nor was he jaundiced. The patient was urged to have an operation, but he refused and went home. There was nothing of special moment in the urine. His temperature ranged from 97.5 to 101.5° F. At his home the abscess ruptured into the lung and he spat up a large quantity of pus. He grew progressively weaker and died about February 5th.

In this case the history of dysentery and the patient's condition on inspection were almost sufficient in themselves to make the diagnosis. The high situation of the diaphragm phenomenon was a most interesting feature.

Case IV.—Clinical Summary. Imperfect history. Marked cough. Pain in the right side. No sweats, irregular fever. Leucocytosis. Diagnosis of empyema. Operation. Multiple abscesses of the liver. Drainage of a large one. Death. Autopsy.

Jos. K., aged forty years, admitted December 4, 1901, complaining of pain in the right side and fever. He was a Pole, did not speak English, and the history was difficult to obtain.

His present illness had begun two weeks before admission with a severe pain in the right side, which was exaggerated as the patient drew a deep breath. He had had no definite chills, but did have chilly sensations. He had had marked

cough from the onset and spat up blood once during the first week. He had had no sweats. The bowels had been regular.

On admission the patient looked ill, had a sallow, gray, septic appearance, and was somewhat cyanosed. Respiration was increased. He had a full, emphysematous chest. On the right side there was flatness to the fourth rib with distant breath sounds and diminished vocal fremitus. When sitting up the flatness reached to the lower border of the third rib. Over the dull area there were diminished vocal fremitus and distant breath sounds. The heart impulse could not be localized. The abdomen was full, particularly in the epigastric region. The edge of the liver could be felt 4.5 cm. below the costal border. There was a leucocytosis of 22,800. The temperature range for the first few days was between 100 and 104.5° F. A needle was inserted in the sixth left interspace in the mid-axillary line and pus was obtained. The patient was transferred at once to the surgical side.

The eighth rib was resected and when the pleural cavity was opened it was found normal. The wound in the pleura was then closed, and the following day a large abscess of the liver was evacuated through an incision in the diaphragm. Amebæ in abundance were found in the pus. The patient died on the 9th.

The autopsy showed multiple abscesses of the liver and small ulcers in the colon. The case was a hopeless one for surgery. There were numerous large abscesses, and it would not have been possible to reach them by any surgical procedure.

Case V.—Clinical Summary. Five months before admission an attack of dysentery. Subsequently an illness supposed to be typhoid fever with irregular temperature and night sweats.

Sudden attack of coughing in which he spat up large quantities of pus of a reddish-brown color. Signs of a hepato-pulmonary abscess. Amebæ in the pus. Patient recovering.

J. H. B., of Virginia, colored, aged forty-six years, admitted January 23, 1902, complaining of weakness. During last September and October he had an attack which was supposed to be typhoid fever. He had diarrhea for three or four days with mucus and blood in the stools, which were from three to seven in the day. A number of people in his neighborhood had attacks of the same character. On September 18 he had an attack of cramps in the stomach, headache, fever and pain in the right side. After this he was ill for three weeks with what the doctor called typhoid fever. Then he had irregular fever for several weeks with severe night-sweats. On November 9, during the night, he had an attack of coughing of great severity, during which he spat up a large quantity of blood and pus. The attacks of coughing have persisted ever since and every morning he coughs up reddish-brown mucus. He has had no pain since November 9, but has been growing weaker.

On admission he was looking fairly robust; there was a bulging in the right lower thorax, especially behind and in the flanks, and there was a little fulness at the right costal border. There was flatness in the right side beginning at the fourth rib and extending into the axilla and as high behind as the lower half of the scapula. The breath sounds were suppressed. Just beyond the posterior axillary line there was a region in which large gurgling râles were heard when he coughed and there was a friction sound in the right axilla. The edge of the liver was not palpable. There was no blood and no mucus in the stools and nothing was found on passing the rec-

tal tube. He had a leucocytosis of nearly 15,000 and a decided anemia, the red blood corpuscles numbering only a little over 2,500,000.

When I saw this patient a few days after his admission I was at once struck by the character of the sputum, which looked very much like that which we have learned to recognize as almost characteristic of liver abscess discharging through the lung. No amebæ, however, had been found in it. On the 24th, Dr. Warfield inserted a needle deep between the eighth and ninth ribs in the posterior axillary lines and drew off a brownish-red, very grumous-looking pus which contained motile amebæ.

As we had several cases in which the abscess had been discharged through the lung and the patients had made a good recovery, we thought it best to wait a few weeks before operating. He is now very much better. His expectoration has diminished, his cough is not nearly so severe, his temperature is normal, and he is gaining in weight. The right side of the chest has become flattened, there is less expansion and the intercostal spaces are very much narrowed. There is flatness to the fourth rib. There is everywhere feeble breathing over the dull region, and on coughing one can hear medium-sized râles.

I may briefly refer to a case at present in the private ward, which I have been seeing at intervals with Dr. Thayer—a man from Norfolk, who has had recurring attacks of amebic dysentery for the past six or eight months. He came into the hospital in a condition of great emaciation, with very frequent evacuations, and for some weeks we were very doubtful about his recovery. With careful irrigations and dieting he began to improve, and early in February the dysentery seemed to be cured entirely. He improved in color and altogether has done remarkably well.

For between two and three weeks he has had persistent pain in the right side, far back under the edge of the ribs, and the liver has been increasing in size, so that it is now three finger-breadths below the costal margin. He has a little fever every evening, up to 100° F., a slight leucocytosis and every night a sweat, but he is gaining in weight, and during the past week he gained some two or three pounds. The question is whether he, too, has not an abscess of the liver.¹

Several points are illustrated in these five cases.

Latency.—In Case I. the abscess was not large and the features of the case were singularly negative, there being absence of fever, of chills, of sweats and of leucocytosis, until just before the operation. There were, however, two features worthy of special comment, viz., the remarkable diffuse cyanosis, for which I cannot offer any satisfactory explanation, and the localized swelling above the right costal border, which is sometimes seen in abscess of the liver which approaches the surface and is preparing to perforate. At operation, however, this was found to be associated with a group of adhesions between the liver and the costal margin, but there was no necrosis and no sign of the abscesses actually pointing in this situation.

The Liability to Error in Diagnosis.—I must say Case II. was what Niemeyer used to call “a mortifying postmortem disclosure.” A few days after her admission the patient was seen with a view to the possibility of surgical interference, but the symptoms seemed to point so strongly to malignant disease that we did not think it worth

¹After the delivery of the lecture this patient's liver increased in size, the bulging in the right flank became more marked, and on March 8th Dr. Finney operated and evacuated an enormous abscess. A point of very great interest in this case is the fact that there was progressive increase in weight and the general condition was good. He had been sitting up and looked well.

while to put her to the trouble of an exploratory operation. As the specimen showed, operation might have done good, as the abscess could have been easily evacuated. Such a case makes one strongly in favor of the exploratory incision for diagnostic purposes.

Case IV. illustrates one of the commonest errors in diagnosis, the mistaking of a large abscess projecting upward into the lung for empyema; nor is the diagnosis always cleared up by the exploratory needle. Large abscesses toward the surface of the right lobe pass high into the pleura in the direction of least resistance and the features may simulate closely those of a right-sided exudate.

Case V. as seen to-day would be readily taken for a case of empyema which had perforated into the lung and was healing, but the character of the attack following dysentery, the sudden expectoration of the anchovy-sauce-like pus and the presence of amebæ were sufficient to settle the diagnosis.

Leucocytosis in Abscess of the Liver.—A point of very considerable interest is the question of leucocytosis in amebic abscess of the liver. From the history of these cases and of others, too, some of the statements on this point need revision. In Case I., on admission, the leucocytes were only 6,000 per cubic millimeter and only once rose to 11,000. In Case II. the leucocytes were only between 8,000 and 10,000 per cubic millimeter. In Case III. they were only 9,000 per cubic millimeter. In Case IV. there was a leucocytosis of 22,000, and in Case V. a leucocytosis of 15,000. Three of the cases, as you see, had practically no leucocytosis. The strong statements as to the invariable presence of leucocytosis in abscess of the liver—made even, I am sorry to say, in the

recent fourth edition of a text-book of medicine in which I am interested—require to be modified.

Lastly, amebic abscess of the liver is not always associated with existing ulceration in the intestines, as is shown by the postmortem in Case II. The patient may have had dysentery months before and the ulcers may have healed completely.

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NOTE ON THE OCCURRENCE OF ASCITES IN SOLID ABDOMINAL TUMORS.

By WILLIAM OSLER, M. D.,
of Baltimore, Md.

Professor of Medicine, Johns Hopkins University.

The interesting lecture by Dr. Eden in the *Lancet* of February 8th., on the two cases of solid abdominal tumor with ascites, calls attention to a not sufficiently recognized cause of abdominal dropsy. In 1885, I saw with Dr. Walker, of Dundas, Ontario, a woman with recurring ascites, of doubtful origin, for which she had been tapped many times. Fortunately I saw her a day or two after the removal of the fluid, and was able to feel a tumor in the lower part of the abdomen. A week later, Dr. Thomas, of New York, removed a solid ovarian growth, and the patient has been well ever since.

My interest in the subject has been renewed recently by a very remarkable case referred to me by Dr. Koehler and Dr. Fackler, in a woman, aged 53, who had had at intervals for three years attacks of ascites. Within the past four months she had been tapped four times. Ten years ago it was stated that a tumor had been detected in the abdomen. There was a good deal of discussion as to the nature of the case, and she was referred to me for a decision as to the advisability of an operation. There was a solid tumor in the lower abdomen, which could be moved from side to side. I suggested the possibility of dropsy dependent upon a solid ovarian tumor, and asked my colleague, Dr. Kelly, to operate. He found a large fibroma of the right ovary with twisted pedicle and adhesions to the omentum. The tumor was removed, and the patient has recovered.

Dr. Hunner, Professor Kelly's first assistant, has very kindly collected for me the cases bearing upon

this point from the gynecological clinic of the Johns Hopkins Hospital. Among 9400 cases there have been 10 patients with solid ovarian tumors, the ages ranging from 32 to 63. In six of these cases ascites was present on admission. Three of the cases had required repeated tapping. All of the cases recovered after operation.

As Dr. Eden remarks, ascites is the rule with solid tumors of the ovary, and so rare with fibroids of the uterus that its presence almost serves to exclude them. Other forms of tumor may be associated with ascites. In Montreal I saw a case of leukemia with recurring ascites. On the occasion of my first visit the distension was so great that the spleen could not be felt; in fact, the diagnosis was not made until after the patient had been tapped. In a case of a solid tumor of the mesentery there was an ascites of moderate degree.

The association is one to which the attention of the profession has not been called sufficiently. I was so impressed with it in the case upon which Dr. Thomas operated, that I made a reference to solid tumors as a cause of recurring ascites in the first edition of my text-book (1892). The question of operation is a very important one; the solid ovarian tumor is usually benign, and, as mentioned, the cases in Dr. Kelly's clinic have uniformly recovered.

ON HEREDITY IN BILATERAL CYSTIC KIDNEY.

BY

WILLIAM OSLER, M.D.,

Professor of Medicine, Johns Hopkins University.

Since reporting the two cases in *American Medicine* of March 22, the following case has come under observation, illustrating the unusual feature of heredity in this condition :

B. E. B., aged 39, Chestnuthill, Mass. He was perfectly well until two years ago, when he had influenza severely. He at that time had hematuria, and three years before, while coasting, he tripped and had a fall. and then had hematuria. Before this he had noticed that he had not been in as good health as usual, and had some fulness of the abdomen, more at times than at others, and had felt a hardness in it. He was under the care of Dr. Baldwin, of Chestnuthill, and he at this time began to fear that he had the same malady of which his mother died. In 1882 Dr. Fitz performed a necropsy on his mother and found bilateral cystic kidneys. This statement is confirmed in a letter from Dr. Fitz, who says that the patient was supposed to have scrofulous glands. She died unconscious in the fiftieth year of her age, probably in a state of uremia.

With the exception of occasional attacks of dyspepsia, the patient had been strong and well, had taken plenty of exercise, had no pain in the back, no lameness. He has been playing golf and has felt very well and vigorous. He had been seen by Dr. Folsom and by Dr. Fitz, both of whom decided that he had bilateral cystic kidneys.

Present Condition.—The patient looks very well, of good color. There is nothing in his appearance to attract attention. There is a little fulness in the upper abdomen. I dictated the following note at the time of examination: Robust, healthy-looking man; weight about 145, stripped; good color; tongue clean. Pupils are of medium size, react well to light and on accommodation. Superficial arteries are sclerotic. Heart: apex beat in fourth and fifth, in and just inside the nipple a little forcible; rather wide area of pulsation; aortic second palpable; soft systolic at apex; ringing, accentuated aortic second.

Abdomen.—Symmetrical; looks a little full in proportion to the chest. The costal border in the nipple line is lifted on both

sides; a little greater fulness below the right costal border. The flanks bulge considerably. Girth of abdomen at navel, 85 cm.; at level of ensiform, 89 cm. From behind slight bulging in both flanks. When he stands up there is a marked prominence of the abdomen, particularly in the flanks. The lower ribs have been spread by the tumors. On palpation both flanks are occupied by large masses. On the left side, the larger, the tumor extends fully three inches below level of navel; not so much to be felt except on deep pressure below the costal border in the nipple line. On bimanual palpation the mass can be lifted up and visibly pressed forward; irregularities can be distinctly felt. The descending colon runs over it, and can be felt as a cord (he himself has noted that it can be moved from side to side). In the right side the mass is not so large. The colon is felt in front of it. There are several distinct nodular prominences; one can feel definite hemispheric irregularities with the greatest ease. Both masses descend with inspiration. The liver is not enlarged; perhaps a little pushed up by the tumor. The thyroid is not enlarged; both lobes are palpable. Both discs are clear.

Urine.—Pale, straw yellow; clear; no precipitate, acid, 1.012; faint trace of albumin; no sugar; no diazo. Microscopically (centrifugalized specimen) no casts to be found; few squamous cells.

The bilateral tumors, the cardiovascular changes, the recurring hematuria and the condition of the urine make the diagnosis quite clear. The unusual feature is the fact that his mother died of the same disease. So far as he knew, no other members of the family had been attacked.

With reference to heredity in this condition Morris notes as follows: "Polycystic kidney has been known to follow a natural labor in a mother of five children; it affected only one of her kidneys. There cannot be said to be more than a slight hereditary tendency to polycystic kidney. The three cases in the same family reported by Bar have been just referred to. A case is recorded in which it affected one kidney of a woman two members of whose family died of post-scarlatinal nephritis, and another child, a daughter, had a polycystic kidney." (Vol. i, p. 656.) In a recent paper by Borelius (*Nordiskt Med. Arkiv*, abstracted in the *Journal of the Amer. Med. Assoc.*, 1902, I), three of the four cases which he described belonged to the same family, father, son and nephew.

Amebic Dysentery.

BY WILLIAM OSLER, M.D.,

Professor of Medicine, Johns Hopkins University.

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AMEBIC DYSENTERY.*

BY WILLIAM OSLER, M.D.

As, with the exception of the studies of Kartulis, the most important work on the subject of amebic dysentery has come from the Johns Hopkins Hospital, we have naturally followed the recent investigation on dysentery with great interest. I cannot here go into historical details, but the work in this country dates from March, 1890, when I found amebæ in the liver abscess of a young doctor from Panama. Ever since the question of the relationship of the amebæ to dysentery has been one of constant study. In quick succession a series of cases occurred in my wards, and were made the subject of study by Councilman and Lafleur, whose monograph has done much to make this form of the disease widely known.

I do not propose in this discussion to speak of the pathology of the disease or of the characters of the amebæ. What I wish to make is a brief statement as to the colitis, with which in Baltimore we have found the amebæ associated.

A sporadic affection, it has not occurred in wide-spread epidemics, either throughout the city or State, so far as I

*Remarks at a discussion on dysentery at the Philadelphia County Medical Society, Philadelphia, March 26.

know, or in institutions. A very limited number of cases have been admitted to the wards, only ninety-three to date. In a few instances three, four, and five cases have come from the same locality, or three and four members of the same family have been attacked. It has involved chiefly males; only eleven females in our group. It is more common among whites than among the colored; there were only nine colored patients. It is a disease of adults; more than fifty per cent of the cases were in the third and fourth decades.

While the disease may run an acute course and may prove fatal within a few weeks, in a very large proportion of the cases it is chronic, characterized by slight fever and frequent movements, containing mucus, blood, pus, and amebæ. Many cases are from the very outset subacute; a majority of them become chronic, so that the disease drags on for many months or years, with alternating periods of constipation and diarrhea. Very few cases die of the dysentery *per se*; of the ninety-three patients in my wards, only two died of the asthenia induced by the dysentery itself. Two died of perforation.

By far the most important and serious feature of the type of colitis with which the amebæ are associated is the liability to abscess of the liver. Of the ninety-three cases referred to, twenty-three had abscess of the liver. This large percentage is due to the fact that only the more severe cases come to hospital. In Strong's sev-

enty-nine post-mortems on cases of amebic dysentery there were fourteen instances of liver abscess.

While at first, after the work of Shiga and Flexner, there was a feeling that possibly all the forms of dysentery might be due to the bacilli, gradually those who have had the most favorable opportunities for studying the diseases have come to the conclusion that the amebic form of dysentery has well marked and characteristic differences. As Dr. Strong has pointed out in his admirable studies in Manila, where the two forms occur together, the cases can be recognized from each other and readily differentiated. In the first place the amebic variety does not seem to occur in such wide-spread epidemics. Secondly, it rarely has the very acute course, and it kills much more frequently by its complications than by the actual colitis. The chronicity and the liability to recurrence give it a very peculiar stamp. Thirdly, characteristic amebæ are found in the stools or in the liver abscess which may have followed a protracted case. Lastly, and this is a very important point in the differentiation, the serum reaction with Shiga's bacillus is absent in the amebic form. Upon this point we can speak very positively. Since the return of Dr. Flexner from the Philippines there have been some fifteen or sixteen cases of amebic dysentery in my wards, in none of which has the serum reaction, so characteristic of the bacillary form, been present.

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NOTES ON ANEURISM



WILLIAM OSLER, M.D.
Baltimore, Md.

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NOTES ON ANEURISM.

WILLIAM OSLER, M.D.

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY.

BALTIMORE. MD.

SUMMARY.

1. Arteriovenous Aneurism of the Subclavian Vessels.
2. The Humming-top Murmur in Thoracic Aneurism.
3. On the Value of the Fluoroscope in the Diagnosis of Obscure Cases of Thoracic Aneurism.
4. On the Importance of Careful Inspection of the Chest in Thoracic Aneurism.

1. ARTERIOVENOUS ANEURISM OF THE SUBCLAVIAN VESSELS.

The elaborate study by Matas, published in the early numbers of *THE JOURNAL* this year, and his analysis of the 15 cases on record, add interest to the following report:

CASE 1.—CLINICAL SUMMARY. *Bullet-wound of the right subclavian artery and vein in January, 1900. Formation of arteriovenous aneurism. Operation not advised. Good health March, 1902.*

Edward S., aged 29, of Kentucky, was sent to me by Dr. Alderson on April 9, 1900, with the following history: On the night of Jan. 5, 1900, he was shot, receiving four bullets. One entered the left shoulder and is now imbedded in the upper portion of the spine of the scapula and gives no trouble. One entered about the middle of the back of the left arm and passed inwards and downwards to inside the condyle of the humerus, where it was deflected across the bend of the elbow and down the forearm, making its exit about the upper third, injuring the ulnar nerve. The third bullet entered the left side a little behind the mid-axillary line between the ninth and tenth ribs. It apparently did not penetrate the chest at all. The fourth entered just about the middle of the fold of the left trapezius, passed inwards and downwards in front of

the spine and came out under the right clavicle. The wounds healed rapidly. He had at first some difficulty in swallowing, but he has gradually been getting well. There was at once considerable swelling in the neighborhood of the clavicle, with marked pulsation, a thrill and a bruit.

Present Condition.—He looks well. Tongue is clean. Chest is well formed. Immediately above the free margin of the middle of the left trapezius there is a bullet-wound, the point of entrance of the ball which caused the aneurism. The left clavicle stands out a little more prominently than the right. The right clavicle is just visible. The supraclavicular fossa is occupied by a pulsating swelling which causes a marked prominence between the sterno-clavicular margin, extending outward a distance of about 7 cm. It does not lift the sterno-cleido-mastoid muscle, the sternal outline of which is plainly marked. The sternal notch is plainly marked. Above, the swelling extends for fully 7 cm. The pulsation is visible over the whole tumor. From behind it is very noticeable. On palpation there is a marked thrill, continuous, but with systolic intensification, felt and heard over the whole tumor, and felt up the neck fully 7 cm. from the clavicle. It is well felt on deep pressure to the right in the sternal notch, not felt on the clavicle. The tumor forms a distinct pulsating mass about the size of, or a little larger than, an egg, quite painless. No thrill is felt below the clavicle or over the body of the heart or on the sternum. Apex beat in nipple line; no increase in area of cardiac flatness. On auscultation both sounds are loud and clear at apex and over the whole precordia. Everywhere, too, from the apex up, increasing in intensity, is heard a humming-top murmur, with marked systolic intensification. At the sternum it is very loud, and over the aneurism reaches its maximum intensity. An interesting feature is that he feels the pulsation in the left ear, not in the right. The murmur is of extraordinary intensity, heard up and down the neck, heard along the axillary artery to the elbow. The systolic murmur is very intense, and the whole diastole is occupied by a wheezing, wiry *Æolean* murmur. In the recumbent posture the tumor does not look larger, and the thrill is not so evident. The pulsation in the subclavian below the clavicle on the left side is visible. On the right side it is not visible. There is a marked difference between the pulse in the radial arteries; the right is feeble, only just to be felt. The brachial pulse can be felt. The axillary can be felt, much feebler on the right side than on the left. The carotid on the right side is full and easily felt. There is no thrill in it on palpation. There is no difference in the pulse in the temporal arteries. The bullet was located with the *x*-rays, and can be felt just below the clavicle.

There is no question that the bullet in this case has nicked the subclavian artery and vein, causing arteriovenous aneurism. The man's general condition was good, and as he was improving I counseled very strongly non-interference. Subsequently he saw several surgeons, some of whom were anxious to operate, but fortunately he escaped them. Since then he has been doing well, and I heard from his physician, March, 1902, that the tumor is smaller and he is able to do quiet work and has little or no inconvenience.

The question of operation in these cases has been very fully discussed by Matas in his exhaustive study above referred to. Of his collection of 15 cases 4 were operated on, 3 within 12 days of the injury, and one 32 years after, which was the only one fatal. Unfortunately, 6 of the 11 cases passed out of observation within a few weeks or months after the injury, while the lesion was still active. The ultimate result of the other cases shows that the condition may remain quiescent for a long period of years. In a few instances there were serious disturbances of the circulation and innervation of the hand and arm, while in one case (Watmann's), after a latent period of thirty-one years, the lesion became active and gave rise to fatal complications.

The condition of arteriovenous aneurism has interested me for a number of years, having had under observation at intervals a man whose case I described in the *Annals of Surgery*, 1893. At that time he was twenty-five years of age. When fifteen he had fallen and a lead-pencil in his waistcoat pocket penetrated the axilla, causing an arteriovenous aneurism. He had remained very well, had been very active and strong, had rowed in boat races. I heard of this patient not many months ago. He had served through the South African war, so that his general condition must have remained good. The aneurism has persisted now for more than twenty-three years.

Arteriovenous aneurism is so rare a lesion that even surgeons of large experience are often a little perplexed as to the best course to follow. I am very much impressed with this in the extraordinary differences of opinion given to the young man with the lesion high up in the axillary artery. The conclusions of Matas which are strongly in favor of non-interference may be quoted:

"The statistics which we furnish in this paper—the most complete list of the reported instances of this rare lesion which has thus far appeared—tend to confirm the arguments of the 'let-well-enough-alone' policy, in so far as they demonstrate that in at least 11 of the 15 cases the patient survived the immediate effects of the injury and of the arteriovenous aneurism that followed it for variable and often long periods of time."

2. THE HUMMING-TOP MURMUR IN THORACIC ANEURISM.

In September, 1888, there was admitted under Dr. Pepper's care at the University Hospital, Philadelphia, a Chinaman, whose case I had frequent opportunities to study with Dr. Crozier Griffith. The case was reported by Pepper and Griffith in the "Transactions of the Association of American Physicians," Vol. V. The remarkable features were cyanosis, and a murmur of extraordinary character, heard loudest at the aortic cartilage and accompanied with a thrill. As described by the writers, the murmur was "loudest and highest pitched with the cardiac systole; it died away very considerably during the diastole, and lowered its pitch by several tones, to rise again both in volume and pitch with the next systole. It was thus continuous, and had a distinctly venous quality, although unlike a venous hum in that it was distinctly rhythmic." At the autopsy there was found a small aneurism of the ascending aorta which communicated with the superior vena cava by an opening three-fourths of an inch in length. The case made a very definite impression upon me, and I have since learned to recognize the murmur as almost pathognomonic of abnormal communication between the chambers of the heart or between the great vessels at the root of the neck, or of an aneurism at the aorta with the vena cava or pulmonary artery. More definitely, the cases in which I have recognized it have been congenital heart disease with persistence of the ductus arteriosus, cases of imperfection of the ventricular septum, and in the two cases here given:

CASE 2.—CLINICAL SUMMARY. *Young man. Syphilis 3 years before admission. Cough. Shortness of breath. Aneurismal tumor to right of sternum. Loud, continuous murmur with systolic intensification. Postmortem. Communication of a large branch of the right pulmonary artery with the aneurismal sac.*

Joseph M., aged 30, admitted first on July 29, 1901 (Med.

No. 13,212), complaining of shortness of breath, cough and pain in the chest. An important point in his history was that three years ago he had syphilis. He had been a heavy drinker and a heavy smoker. His illness began in October, 1900, with a cough, which was dry and hard and troubled him very much at night. He had shortness of breath from the beginning. These symptoms increased throughout the winter. He had pain first in February.

On his first admission the signs of aneurism of the thoracic aorta were very well marked—a visible bulging with pulsation to the right of the sternum; no thrill; very exaggerated diastolic shock; flatness over the pulsating area. Dr. Futcher, who dictated the note, described the heart sounds as clear and a very faint soft systolic murmur along the left sternal border and over the prominent part of the pulsation. There was no diastolic murmur. The patient was given a gelatin injection and kept at rest. On my return in September I saw him, and he then had very much the symptoms described by Dr. Futcher when first admitted.

Then he returned on December 31. He had been in the country and had become very much worse, having attacks of dyspnea and weak spells. The pulsating tumor was larger. There was a wider extent of flatness. The most remarkable change was on auscultation over the sac. The diastolic shock was extreme and there was a feeble thrill. There was a very loud, continuous murmur occupying the entire cardiac cycle, with a great deal of echoing reverberation and marked systolic intensification.

The sac was evidently so large and so far out that, while I recognized the murmur as the kind heard with abnormal communication, I must say I thought it possible that this remarkable whirring, continuous murmur might be produced in a very large sac.

The patient died Jan. 10, 1902. The anatomic diagnosis was arteriosclerosis, aneurism of the arch of the aorta, compression and atelectasis of right lung. On the posterior wall of the sac, where it had pressed into the lung, one of the main branches of the right pulmonary artery, fully as large as the little finger, opened directly into the sac.

CASE 3.—CLINICAL SUMMARY. *Syphilis two years before observation. Cyanosis. Shortness of breath. Great congestion of the veins of the upper-half of the body and of the arms. Gradual development of compensatory circulation in the mammary and epigastric veins. Over the manubrium and aortic regions a continuous murmur with marked systolic intensification, limited to the area about the aortic cartilage and the middle of the manubrium. Death. No Autopsy.*

Jos. S., aged 39, an iron-molder, applied at the dispensary of the Johns Hopkins Hospital Dec. 7, 1889. He had been ill

since January, complaining of giddiness, cough, shortness of breath, swelling of the feet and a congested and bluish condition of the face, which became aggravated when he attempted to do heavy work. He is a thick-set, well-built, muscular man. He had a chancre two years ago. There is no history of rheumatism or chorea, but in September, 1888, he was in bed three weeks with some obscure pulmonary trouble.

Physical Examination. Face is swollen and reddish; lips and ears are cyanotic. Conjunctivæ watery. The tongue is clean, deeply congested and the whole of the pharyngeal mucosa is intensely engorged. Chest is large, antero-posterior in diameter, deep. The skin, covering the entire thorax and of the arms is congested. The venules along the line of the diaphragm and in the lateral region of the chest are dilated. The neck is thick, supra-clavicular spaces distended, sternal notch obliterated. The breathing is quiet, 24 to the minute. The apex beat is indistinct, but a feeble impulse is visible in 5th in nipple line and there is throbbing in the epigastric notch. There is a feeble shock of the first to be felt at the apex, but there is no pulsation at the base on deep pressure. There is no dulness on the manubrium sterni and the superficial area of heart dulness is not increased. On auscultation there is a systolic murmur at apex, propagated to the back. The second sound is ringing. Along the left sternal border the systolic murmur becomes more intense. Over the manubrium there is a loud murmur of very peculiar character, not like an ordinary aortic systolic, short and rough, but a murmur which seems continuous and during the systole greatly intensified. The second sound at the base is clear and ringing. The radial pulses are equal; pupils equal. There is no brassy cough. On examination of the chest a few piping râles with prolonged expiration were noted.

The patient was seen on four occasions during the next month. The cyanosis and shortness of breath had increased. On January 7 I made the following note: Much worse since last seen on the 2d. The face is much swollen and absolutely blue, looking like that of a man who had been strangled. The mucous membrane of the pharynx intensely livid. Eyelids swollen; conjunctivæ deeply engorged. The neck is enlarged; the external jugular is prominent. The upper part of the chest and both arms are swollen but not edematous. The veins of the arms are full. The whole subcutaneous tissue feels thickened and infiltrated. The right side and the right arm are more swollen than the left. In the lower chest zone the venules are greatly enlarged, but no large mammary veins are visible. When stripped the contrast between the upper and the lower parts of the body is remarkable. The engorgement goes as far as the lower abdominal zone. The legs are quite pale.

The amount of subcutaneous infiltration is such that the superficial veins are not visible. The apex beat is indistinct. There is a systolic shock. The area of cardiac dulness is not increased. In 5th interspace below nipple, there is a loud systolic murmur not obliterating the first sound, at aortic cartilage and on manubrium the same remarkably loud, continuous murmur is heard, with systolic intensification; second sound clear and ringing. The systolic murmur is heard to left and right two inches from the sternum, but the continuous murmur is only heard at the more limited area about the aortic cartilage with a maximum at mid-manubrium.

The radial pulses were equal, 98; respiration quiet. The subjective sensations of the patient are remarkable. He says that he feels comfortable with the exception of the feeling of distension in face, chest and arms. It is extraordinary how slight is the distress in breathing in a man presenting a condition of such extreme cyanosis. He says that one of his chief annoyances is the shock which his appearance gives to his friends. He is not drowsy. His intellectual condition is perfect. He sleeps at night with his head high.

About two weeks subsequent to this visit we heard that the patient had died; but his wife refused an autopsy. She said he got progressively worse and even more cyanotic. He was taken to the city hospital, but whether he died there or at his house she did not say.

This patient presented the characteristic features which Pepper and Griffith describe in an analysis of some 29 cases of communication between an aneurism of the aorta and the superior vena cava, more particularly the extreme cyanosis of the face and upper parts of the body, with evidences of obstruction of the circulation in the tributaries of the superior vena cava. They regard the murmur as characteristic of communication between an artery and a vein, and state that it was first described by Thurman in 1832-33. The characters are:

1. It is continuous, occupying both the systole and diastole.

2. There is a systolic reinforcement, often of great intensity.

3. The venous quality of the murmur, resembling the characteristic venous hum in the jugular and the murmur over the thyroid in Graves' disease.

The quality varies. It may be a buzzing or it may have a remarkable, sonorous, vibratory character, or, again, it may be a churning or purring murmur. Ord describes

it very well as a long continuous humming murmur, never ceasing, but varying in intensity, more sonorous during systole, fainter during diastole. To Thurman the credit appears to be due for the recognition of a murmur of this quality as pathognomonic of arterio-venous aneurism. The question has been very fully discussed by Sir William Gairdner in the Glasgow Hospital Reports, 1899, in the report of an interesting case in which a small aneurism of the ascending portion of the arch communicated with the pulmonary artery.

3. ON THE VALUE OF THE FLUOROSCOPE IN THE DIAGNOSIS OF OBSCURE CASES OF THORACIC ANEURISM.

CASE 3.—CLINICAL SUMMARY. *Cough and dyspnea for six months. Much emaciation. Flatness to left of sternum. Diagnosis of mediastinal sarcoma. Examination by fluoroscope showed a characteristic pulsating tumor. Subsequent slight pulsation of the thoracic wall. Wiring of the sac. Hemoptysis. Death.*

On Jan. 15, 1902, I was consulted by Mr. T. R. F., who had been complaining of cough for six months, loss in weight and pains through the chest. I was impressed at once with the expression of great distress and anxiety in the poor fellow's face. He looked worn and exhausted with suffering, and he said that he had not been able to lie down for some weeks, and had had nights of indescribable anguish owing to the orthopnea, pain and sense of smothering. I was impressed at once with the noisy, stridulous, tracheal character of the breathing. He had been a bartender, had taken alcohol freely, and had had venereal sores at different times; the strong probability is that he has had syphilis. He thinks that for a year he has had some cough, but for six months there have been shortness of breath, loss of weight and pain in the chest. About three months ago his voice changed. He has had no spitting of blood. Of late he has had frightful paroxysms of pain and orthopnea, particularly at night. He had consulted a number of physicians in New York and elsewhere, and the diagnosis had been made of mediastinal sarcoma.

On examination the chest was well-formed, expansion good and seemed equal on both sides. No abnormal area of pulsation was noticeable; no throbbing in the sternal notch. There was an area of impaired resonance in the first, second and third left interspaces and over the central portion of the manubrium. The point of maximum impulse was in the fifth interspace, $10\frac{1}{2}$ cm. from the mid-sternal line. The cardiac flatness was not increased. There was a soft systolic murmur at the apex; the second sound was clear and without special

accentuation over the area of dullness. The pulse was of good volume; the left radial was smaller than the right. The breath sounds on the left side were less intense than on the right.

Altogether, at the first examination I was inclined to agree with the diagnosis which had already been made of mediastinal sarcoma. It seemed to me that an aneurism would by this time have shown more definite physical signs. The patient entered the Johns Hopkins Hospital that I might study his case more fully. The following additional points were then made out. First, "with the *x*-rays there was a large shadow seen, which extended from the upper end of the sternum to the upper border of the third rib. It did not extend to the right beyond the shadow of the vertebræ, but did to the left to about opposite a point $\frac{2}{5}$ of the extent of the clavicle from the inner end. It was sharply defined with clear outlines, showed slight pulsation and moved very slightly to the left on deep inspiration. It could be clearly separated from the shadow of the heart. Looked at from behind it looked larger than from in front. It is worthy of note that it seemed denser and with much sharper outlines than in cases of undoubted aneurism previously examined." (Dr. McCrae.) Secondly, on the second day after admission, on getting the patient into a bright light and examining the chest critically, there was seen a distinct slight visible pulsation in the first left interspace and the left clavicle was slightly lifted. Thirdly, there was well-marked paralysis of the left vocal cord. Fourthly, the blood pressure showed the right brachial maximum 118, left brachial maximum 103. These points seemed quite sufficient to settle the diagnosis of aneurism against that of mediastinal sarcoma. It is interesting to note that there was no bruit over the pulsation; no special accentuation of the aortic second sound. The patient's condition was most distressing. The nights were passed in terrible distress and in order to reduce the blood pressure he was bled on several occasions with very great relief. On January 20 his condition seemed perfectly desperate, and as a last resort I asked Dr. Finney to wire the sac. The patient stood the operation remarkably well. The needle was inserted in the second left interspace about 5 cm. from the sternal margin over an area in which there was marked pulsation. "A medium-sized needle was inserted in a direction backward and slightly downward and inward. When the needle had been inserted about 6 cm. a pulsation was transmitted to it. It was then pushed in about 2 cm. further, when fresh blood escaped in spurts. Ten feet and seven inches of No. 27 spring silver wire, wound large, (75 parts copper to 1000 silver, alloy) was then slowly inserted. A current of 10

ma. was then allowed to pass through the wire for one hour." The patient seemed very much benefited by the operation, and seemed for a few days decidedly improved. Then, on the night of the 17th he had a small hemorrhage. On the 18th he had a sudden profuse hemorrhage from the lungs and died in a few moments. The heart beat faintly for thirty seconds after the last respiration.

Postmortem there was found an aneurism of the transverse arch, containing mural thrombi within the sac, and the wire was within the sac. There was compression of the left bronchus, perforation into the trachea, hemorrhage into the right lung.

It is particularly in this group of aneurisms, with symptoms and no physical signs, that the *x*-ray examination is of such service, but we have not had a case in which it was more clearly demonstrated than in the one here noted.

1. ON THE VALUE OF CAREFUL INSPECTION OF THE CHEST IN THE DIAGNOSIS OF THORACIC ANEURISM.

A bare chest, a good light and good eyes are the essentials. Routine in the examination is important. Invariably at the ward visit after the inspection of the front of patient's chest I say to the student, "What next?" and he immediately proceeds to palpation, overlooking the inspection of the back, and which, if not made in the right time, and in a routine manner, may be overlooked altogether.

Many years ago at the Girard Hotel, Philadelphia, I saw a remarkable case which illustrated the value and importance of the point. The patient had a large area of pulsation in the lower front of the chest, extending almost from one nipple to the other, with distinct prominence. There was a double murmur at the base of the heart, and the case had been regarded as one of aortic insufficiency, which condition was present. He had paroxysms of great distress and orthopnea, and there were peculiar features about the case, so that one or two of the leading physicians in Philadelphia had expressed themselves as somewhat puzzled about its nature. Fortunately, after finishing the inspection in front, I turned the patient's back to a good light, and the diagnosis was made at a glance. There was a pulsating aneurismal tumor in the left interscapular region, which had given him no pain whatever, and which had not attracted the attention of his physicians. A remarkable condition

was present in this case, which I had never seen before; namely, a complete absence of the pulse in the iliacs and femorals.

At present in my wards are two cases illustrating this very well; a man (Leonard) has a wide area of impulse in the lower sternum and adjacent interspaces. He has been under observation now for nearly three years, and time and again Dr. Thayer, Dr. Fitcher and myself have discussed the possibilities. A positive diagnosis was not reached until a year ago, when a slight pulsation was seen in the left interscapular region, which has increased, and it is now quite evident that there is a large aneurism of the descending thoracic aorta.

The second case, a man aged about 35, has on inspection of the chest a very well-marked pulsation of the manubrium. The diagnosis of aneurism will be made at a glance. He has had a great deal of dyspnea and pain in the chest. On additional examination it is noted as rather remarkable that with so much pulsation on the manubrium there is little or no flatness. There is a well-marked to-and-fro friction. Inspection of the back shows in the left interscapular region slight bulging, with well-marked visible and palpable pulsation.

Sometimes the diagnosis is hidden beneath a tucked-up undershirt. Last year a robust-looking man consulted me about Nauheim: he had been told that he had heart disease, and a physician in Florida had said that his case was a very suitable one for the Schott baths. When stripped, the diagnosis was made at a glance. The head of the clavicle was lifted out of its bed with each systole, and there was a definite pulsating tumor above the sternal notch with a thrill and a loud to-and-fro murmur. In the numerous examinations he had never taken off his shirt, but had tucked it up, and consequently, nobody had ever noticed the aneurism.

Some years ago I got into trouble by too careful inspection and detecting an early throbbing in the third right interspace. A robust, strong man consulted me for cough, shortness of breath and inability to lie down at night. He had the wheezing, goose-cough, as it is called, and there was to be seen most clearly and distinctly, a pulsation to the right of the sternum. With rest, the symptoms improved and the pulsation lessened remarkably. Other physicians (among them one well-

recognized authority on heart disease) assured the family there must have been a mistake, as there were no signs of aneurism. The patient improved and I saw him about for more than two years. I began to think that there had been a mistake, but subsequent events showed that the diagnosis was correct. Spontaneously, particularly after prolonged rest, the pulsation of an aneurism to the right or left of the sternum may completely disappear. I do not refer here to cases of 20 called dynamic pulsation, but to cases in which the subsequent history and autopsy has confirmed the existence of an aneurism.

WILLIAM BEAUMONT

A Pioneer American Physiologist



William Osler, M.D.
Baltimore

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BALTIMORE.

Come with me for a few moments on a lovely June day in 1822, to what were then far-off northern wilds, to the Island of Michilimacinac, where the waters of Lake Michigan and Lake Huron unite and where stands Fort Mackinac, rich in the memories of Indian and voyageur, one of the four important posts on the upper lakes in the days when the rose and the fleur-de-lys strove for the mastery of the western world. Here the noble Marquette labored for his Lord, and here beneath the chapel of St. Ignace they laid his bones to rest. Here the intrepid LaSalle, the brave Tonty and the resolute Du Luht had halted in their wild wanderings. Its palisades and block-houses had echoed the war-whoops of Ojibwas and Ottawas, of Hurons and Iroquois, and the old fort had been the scene of bloody massacres and hard-fought fights, but at the conclusion of the War of 1812, after two centuries of struggle, peace settled at last on the island. The fort was occupied by United States troops, who kept the Indians in check and did general police duty on the frontier, and the place had become a rendezvous for Indians and voyageurs in the employ of the American Fur Company. On this bright spring morning the village presented an animated scene. The annual return tide to the trading

* An Address before the St. Louis Medical Society, Oct. 4, 1902.

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HDR

post was in full course, and the beach was thronged with canoes and batteaux laden with the pelts of the winter's hunt. Voyageurs and Indians, men, women and children, with here and there a few soldiers, made up a motley crowd. Suddenly from the company's store there is a loud report of a gun, and amid the confusion and excitement the rumor spreads of an accident, and there is a hurrying of messengers to the barracks for a doctor. In a few minutes (Beaumont says twenty-five or thirty, an eye-witness says three) an alert-looking man in the uniform of a U. S. Army surgeon made his way through the crowd and was at the side of a young French Canadian who had been wounded by the discharge of a gun, and with a composure bred of an exceptional experience of such injuries, prepared to make the examination. Though youthful in appearance, Surgeon Beaumont had seen much service, and at the capture of York and at the investment of Plattsburgh he had shown a coolness and bravery under fire which had won high praise from his superior officers. The man and the opportunity had met—the outcome is my story of this evening.

I. THE OPPORTUNITY—ALEXIS ST. MARTIN.

On the morning of June 6 a young French Canadian, Alexis St. Martin, was standing in the company's store, "where one of the party was holding a shotgun (not a musket), which was accidentally discharged, the whole charge entering St. Martin's body. The muzzle was not over three feet from him—I think not more than two. The wadding entered, as well as pieces of his clothing; his shirt took fire; he fell, as we supposed, dead."

"Doctor Beaumont, the surgeon of the fort, was immediately sent for and reached the wounded man in a very short time, probably three minutes. We had just gotten him on a cot and were taking off some of his clothing. After the doctor had extracted part of the shot, together with pieces of clothing, and dressed his wound carefully, Robert Stuart and others assisting, he left him, remarking: 'The man can not live thirty-six hours; I will

come and see him by and by.' In two or three hours he visited him again, expressing surprise at finding him doing better than he had anticipated. The next day, after getting out more shot and clothing and cutting off ragged edges of the wound, he informed Mr. Stuart, in my presence, that he thought he would recover."*

The description of the wound has been so often quoted as reported in Beaumont's work that I give here the interesting summary which I find in a "Memorial" presented to the Senate and House of Representatives by Beaumont. "The wound was received just under the left breast, and supposed, at the time, to have been mortal. A large portion of the side was blown off, the ribs fractured and openings made into the cavities of the chest and abdomen, through which protruded portions of the lungs and stomach, much lacerated and burnt, exhibiting altogether an appalling and hopeless case. The diaphragm was lacerated and a perforation made directly into the cavity of the stomach, through which food was escaping at the time your memorialist was called to his relief. His life was at first wholly despaired of, but he very unexpectedly survived the immediate effects of the wound, and necessarily continued a long time under the constant professional care and treatment of your memorialist, and, by the blessing of God, finally recovered his health and strength.

"At the end of about ten months the wound was partially healed, but he was still an object altogether miserable and helpless. In this situation he was declared 'a common pauper' by the civil authorities of the county, and it was resolved by them that they were not able, nor required, to provide for or support, and finally declined taking care of him, and, in pursuance of what they probably believed to be their public duty, authorized by

* Statement of G. G. Hubbard, an officer of the company, who was present when St. Martin was shot, quoted by Dr. J. R. Bally, of Mackinac Island, in his address on the occasion of the Beaumont Memorial Exercises, Mackinac Island, July 10, 1900. *The Physician and Surgeon*, December, 1900.

the laws of the territory, were about to transport him, in this condition, to the place of his nativity in lower Canada, a distance of more than fifteen hundred miles.

“Believing the life of St. Martin must inevitably be sacrificed if such attempt to remove him should be carried into execution at that time, your memorialist, after earnest, repeated, but unavailing, remonstrances against such a course of proceedings, resolved, as the only way to rescue St. Martin from impending misery and death, to arrest the process or transportation and prevent the consequent suffering, by taking him into his own private family, where all the care and attention were bestowed that his condition required.

“St. Martin was, at this time, as before intimated, altogether helpless and suffering under the debilitating effects of his wounds—naked and destitute of everything. In this situation your memorialist received, kept, nursed, medically and surgically treated and sustained him, at much inconvenience and expense, for nearly two years, dressing his wounds daily, and for considerable part of the time twice a day, nursed him, fed him, clothed him, lodged him and furnished him with such necessaries and comforts as his condition and suffering required.

“At the end of these two years he had become able to walk and help himself a little, though unable to provide for his own necessities. In this situation your memorialist retained St. Martin in his family for the special purpose of making physiological experiments.”

In the month of May, 1825, Beaumont began the experiments. In June he was ordered to Fort Niagara, where, taking the man with him, he continued the experiments until August. He then took him to Burlington and to Plattsburgh. From the latter place St. Martin returned to Canada, without obtaining Dr. Beaumont's consent. He remained in Canada four years, worked as a voyageur, married and had two children. In 1829 Beaumont succeeded in getting track of St. Martin, and the American Fur Company engaged him

and transported him to Fort Crawford on the upper Mississippi. The side and wound were in the same condition as in 1825. Experiments were continued uninterruptedly until March, 1831, when circumstances made it expedient that he should return with his family to lower Canada. The "circumstances," as we gather from letters, were the discontent and homesickness of his wife. As illustrating the mode of travel, Beaumont states that St. Martin took his family in an open canoe "via the Mississippi, passing by St. Louis, ascended the Ohio river, then crossed the state of Ohio to the lakes, and descended the Erie and Ontario and the river St. Lawrence to Montreal, where they arrived in June." Dr. Beaumont often lays stress on the physical vigor of St. Martin as showing how completely he had recovered from the wound. In November, 1832, he again engaged himself to submit to another series of experiments in Plattsburgh and Washington. The last recorded experiment is in November, 1833.

Among the Beaumont papers, for an examination of which I am much indebted to his daughter, Mrs. Kein (Appendix A), there is a large mass of correspondence relating to St. Martin, extending from 1827, two years after he had left the doctor's employ, to October, 1852. Alexis was in Dr Beaumont's employ in the periods already specified. In 1833 he was enrolled in the United States Army at Washington as Sergeant Alexis St. Martin, of a detachment of orderlies stationed at the War Department. He was then 28 years of age, and was five feet five inches in height.

Among the papers there are two articles of agreement, both signed by the contracting parties, one dated Oct. 19, 1833, and the other November 7 of the same year. In the former he bound himself for a term of one year to "serve, abide and continue with the said William Beaumont, wherever he shall go or travel or reside in any part of the world his covenant servant and diligently and faithfully, etc., . . . that he, the said

Alexis, will at all times during said term when thereto directed or required by said William, submit to assist and promote by all means in his power such philosophical or medical experiments as the said William shall direct or cause to be made on or in the stomach of him, the said Alexis, either through and by means of the aperture or opening thereto in the side of him, the said Alexis, or otherwise, and will obey, suffer and comply with all reasonable and proper orders of or experiments of the said William in relation thereto and in relation to the exhibiting and showing of his said stomach and the powers and properties thereto and of the appurtenances and the powers, properties and situation and state of the contents thereof." The agreement was that he should be paid his board and lodging and \$150 for the year. In the other agreement it is for two years and the remuneration \$400. He was paid a certain amount of the money down.

There are some letters from Alexis himself, all written for him and signed with his mark. In June, 1834, he writes that his wife was not willing to let him go and thinks that he can do a great deal better to stay at home. From this time on Alexis was never again in Dr. Beaumont's employ.

There is a most interesting and protracted correspondence in the years 1836, 1837, 1838, 1839, 1840, 1842, 1846, 1851 and 1852, all relating to attempts to induce Alexis to come to St. Louis. For the greater part of this time he was in Berthier, in the district of Montreal, and the correspondence was chiefly conducted with a Mr. William Morrison, who had been in the northwest fur trade and who took the greatest interest in Alexis and tried to induce him to go to St. Louis. (See Appendix B.)

In 1846 Beaumont sent his son Israel for Alexis, and in a letter dated Aug. 9, 1846, his son writes from Troy: "I have just returned from Montreal, but without Alexis. Upon arriving at Berthier I found that he

owned and lived on a farm about fifteen miles southwest of the village.” Nothing would induce him to go.

The correspondence with Mr. Morrison in 1851 and 1852 is most voluminous, and Dr. Beaumont offered Alexis \$500 for the year, with comfortable support for his family. He agreed at one time to go, but it was too late in the winter and he could not get away.

The last letter of the series is dated Oct. 15, 1852, and is from Dr. Beaumont to Alexis, whom he addresses as *Mon Ami*. Two sentences in this are worth quoting: “Without reference to past efforts and disappointments—or expectation of ever obtaining your services again for the purpose of experiments, etc., upon the proposals and conditions heretofore made and suggested, I now proffer to you in faith and sincerity, new, and I hope satisfactory, terms and conditions to ensure your prompt and faithful compliance with my most fervent desire to have you again with me—not only for my own individual gratification, and the benefits of medical science, but also for your own and family’s present good and future welfare.” He concludes with, “I can say no more, Alexis—you know what I *have* done for you many years since—what I have been *trying*, and am still anxious and wishing to do with and for you—what efforts, anxieties, anticipations and disappointments I have suffered from your non-fulfilment of my expectations. Don’t disappoint me more nor forfeit the bounties and blessings reserved for you.”

So much interest was excited by the report of the experiments that it was suggested to Beaumont that he should take Alexis to Europe and submit him there to a more extended series of observations by skilled physiologists. Writing June 10, 1833, he says: “I shall engage him for five or six years if he will agree, of which I expect there is no doubt. He has always been pleased with the idea of going to France. I feel much gratified at the expression of Mr. Livingston’s desire that we should visit Paris, and shall duly consider the interest

he takes in the subject and make the best arrangements I can to meet his views and yours." Mr. Livingston, the American minister, wrote from Paris March 18, 1834, saying that he had submitted the work to Orfila and the Academy of Sciences, which had appointed a committee to determine if additional experiments were necessary and whether it was advisable to send to America for Alexis. Nothing, I believe, ever came of this, nor, so far as I can find, did Alexis visit Paris. Other attempts were made to secure him for purposes of study. In 1840 a student of Dr. Beaumont's, George Johnson, then at the University of Pennsylvania, wrote saying that Dr. Jackson had told him of efforts made to get Alexis to London, and Dr. Gibson informed him that the Medical Society of London had raised £300 or £400 to induce St. Martin to come, and that he, Dr. Gibson, had been trying to find St. Martin for his London friends. There are letters in the same year from Dr. R. D. Thomson of London to Professor Silliman urging him to arrange that Dr. Beaumont and Alexis should visit London. In 1856 St. Martin was under the observation of Dr. Francis Gurney Smith, in Philadelphia, who reported a brief series of experiments, so far as I know the only other report made on him.*

St. Martin had to stand a good deal of chaffing about the hole in his side. His comrades called him "the man with a lid on his stomach." In his memorial address Mr. C. S. Osborn of Sault Ste. Marie states that Miss Catherwood tells a story of Etienne St. Martin fighting with Charlie Charette because Charlie ridiculed his brother. Etienne stabbed him severely and swore that he would kill the whole brigade if they did not stop deriding his brother's stomach.

At one time St. Martin traveled about exhibiting the wound to physicians, medical students and before medical societies. In a copy of Beaumont's work, formerly

* Medical Examiner, 1856, and Experiments on Digestion, Phila., 1856.

belonging to Austin Flint, Jr., and now in the possession of a physician of St. Louis, there is a photograph of Alexis sent to Dr. Flint. There are statements made that he went to Europe, but of such a visit I can find no record.

My interest in St. Martin was of quite the general character of a teacher of physiology, who every session referred to his remarkable wound and showed Beaumont's book with the illustration. In the spring of 1880, while still a resident of Montreal, I saw a notice in the newspapers of his death at St. Thomas. I immediately wrote to a physician and to the parish priest, urging them to secure me the privilege of an autopsy and offering to pay a fair sum for the stomach, which I agreed to place in the Army Medical Museum in Washington, but without avail. Subsequently, through the kindness of the Hon. Mr. Justice Baby, I obtained the following details of St. Martin's later life, and the picture here given, which was taken the year before his death so as to show the wound, which I here show you. Judge Baby writes to his friend, Prof. D. C. MacCallum of Montreal, as follows: "I have much pleasure to-day in placing in your hands such information about St. Martin as Revd. Mr. Chicoine, Curé of St. Thomas, has just handed over to me. Alexis Bidigan, *dit* St. Martin, died at St. Thomas de Joliette on the 24th of June, 1880, and was buried in the cemetery of the parish on the 28th of the same month. The last sacraments of the Catholic church were ministered to him by the Revd. Curé Chicoine, who also attended at his burial service. The body was then in such an advanced stage of decomposition that it could not be admitted into the church, but had to be left outside during the funeral service. The family resisted all requests—most pressing as they were—on the part of the members of the medical profession for an autopsy, and also kept the body at home much longer than usual and during a hot spell of weather, so as to allow decomposition to set in

and baffle, as they thought, the doctors of the surrounding country and others. They had also the grave dug eight feet below the surface of the ground in order to prevent any attempt at a resurrection. When he died St. Martin was 83 years of age, and left a widow, whose maiden name was Marie Joly. She survived him by nearly seven years, dying at St. Thomas on the 20th of April, 1887, at the very old age of 90 years. They left four children still alive—Alexis, Charles, Henriette and Marie.

“Now I may add the following details for myself. When I came to know St. Martin it must have been a few years before his death. A law suit brought him to my office here in Joliette. I was seized with his interests; he came to my office a good many times, during which visits he spoke to me at great length of his former life, how his wound had been caused, his peregrinations through Europe and the United States, etc. He showed me his wound. He complained bitterly of some doctors who had awfully misused him, and had kind words for others. He had made considerable money during his tours, but had expended and thrown it all away in a frolicsome way, especially in the old country. When I came across him he was rather poor, living on a small, scanty farm in St. Thomas, and very much addicted to drink, almost a drunkard one might say. He was a tall, lean man, with a very dark complexion, and appeared to me then of a morose disposition.”

II. THE BOOK.

In the four periods in which Alexis had been under the care and study of Beaumont a large series of observations had been recorded, amounting in all to 238. A preliminary account of the case and of the first group of observations appeared in the *Philadelphia Medical Recorder* in January, 1825. During the stay in Washington in 1832 the great importance of the observations had become impressed on the Surgeon-General, Dr. Lovell, who seems to have acted in a most generous and

kindly spirit. Beaumont tried to induce him to undertake the arrangement of the observations, but Lovell insisted that he should do the work himself. In the spring of 1833 Alexis was taken to New York and there shown to the prominent members of the profession, and careful drawings and colored sketches were made of the wound by Mr. King. A prospectus of the work was issued and was distributed by the Surgeon-General, who speaks in a letter of sending them to Dr. Franklin Bache and to Dr. Stewart of Philadelphia, and in a letter from Dr. Bache to Dr. Beaumont acknowledging the receipt of a bottle of gastric juice, Bache states that he has placed the prospectus in Mr. Judah Dobson's store and has asked for subscribers. Beaumont did not find New York a very congenial place. He complained of the difficulty of doing the work owing to the vexatious social intercourse. He applied for permission to go to Plattsburgh, in order to complete the book. After having made inquiries in New York and Philadelphia about terms of publication he decided, as the work had to be issued at his own expense, that it could be as well and much more cheaply printed at Plattsburgh, where he would also have the advice and help of his cousin, Dr. Samuel Beaumont. In a letter to the Surgeon-General, dated June 10, 1833, he acknowledges the permission to go to Plattsburgh, and says: "I shall make my arrangements to leave here for Pl. in about a week to *rush* the execution of the Book as fast as possible. I am now having the drawings taken by Mr. King engraved here."

The summer was occupied in making a fresh series of experiments and getting the work in type. On December 3 he writes the Surgeon-General that the book will be ready for distribution in a few days and that 1,000 copies will be printed.

The work is an octavo volume of 280 pages, entitled "Experiments and Observations on the Gastric Juice and the Physiology of Digestion," by William Beau-

mont, M.D., Surgeon in the United States Army. Plattsburgh. Printed by F. P. Allen, 1833. While it is well and carefully printed, the paper and type are not of the best, and one can not but regret that Beaumont did not take the advice of Dr. Franklin Bache, who urged him strongly not to have the work printed at Plattsburgh, but in Philadelphia, where it could be done in very much better style. The dedication of the work to Joseph Lovell, M.D., Surgeon-General of the United States Army, acknowledges in somewhat laudatory terms the debt which Beaumont felt he owed to his chief, who very gratefully acknowledges the compliment and the kindly feeling, but characterizes the dedication as "somewhat apocryphal."

The work is divided into two main portions; first, the preliminary observations on the general physiology of digestion in seven sections: Section I, Of Aliment; Section II, Of Hunger and Thirst; Section III, of Satisfaction and Satiety; Section IV, Of Mastication, Insalivation and Deglutition; Section V, Of Digestion by the Gastric Juice; Section VI, Of the Appearance of the Villous Coat, and of the Motions of the Stomach; Section VII, Of Chylification and Uses of the Bile and Pancreatic Juice. The greater part of the book is occupied by the larger section of the detailed account of the four series of experiments and observations. The work concludes with a series of 51 inferences from the foregoing experiments and observations.

The subsequent history of the book itself is of interest, and may be dealt with here. In 1834 copies of the Plattsburgh edition, printed by F. P. Allen, were issued by Lilly, Wait & Co., of Boston.

In the Beaumont correspondence there are many letters from a Dr. McCall, in Utica, N. Y., who was an intimate friend of a Mr. Wm. Combe, a brother of the well-known physiologist and popular writer, Dr. Andrew Combe of Edinburgh. Doubtless it was through this connection that in 1838 Dr. Combe issued an edi-

tion in Scotland, with numerous notes and comments. (Appendix C.)

The second edition was issued from Burlington, Vt., in 1847, with the same title page, but after Second Edition there are the words, Corrected by Samuel Beaumont, M.D., who was Dr. William Beaumont's cousin. In the preface to this edition the statement is made that the first edition, though a large one of 3,000 copies, had been exhausted. This does not agree with the statement made in a letter of Dec. 3, 1833, to the Surgeon-General, stating that the edition was to be 1,000 copies. Of course more may have been printed before the type was distributed. While it is stated to be a new and improved edition, so far as I can gather it is a verbatim reprint, with no additional observations, but with a good many minor corrections. In an appendix (D) I give an interesting letter from Dr. Samuel Beaumont with reference to the issue of this edition.

A German edition was issued in 1834 with the following title: "Neue Versuche und Beobachtungen ueber den Magensaft und die Physiologie der Verdauung, auf eine hochst merkwurdige Weise wahrend einer Reihe von 7 Jahren, an einen und demselben Subject angestellt." Beaumont's earlier paper, already referred to, was abstracted in the *Magazin der auslandischen Litteratur der gesammten Heilkunde*, Hamburg, 1826, and also in the *Archives generales de Medecine*, Paris, 1828. I can not find that there was a French edition of the work.

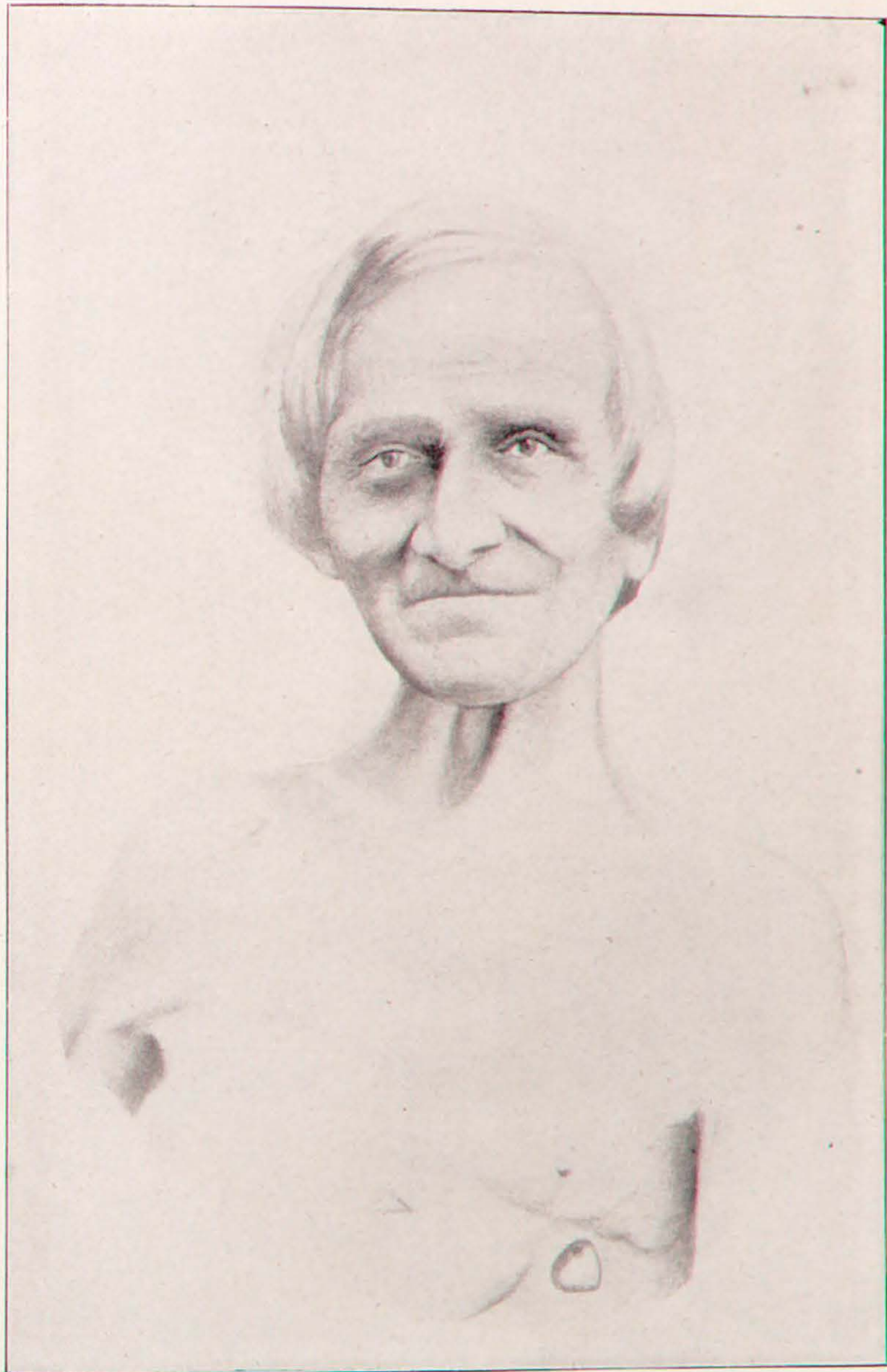
The "Experiments and Observations" attracted universal attention, both at home and abroad. The journals of the period contained very full accounts of the work, and within a few years the valuable additions to our knowledge filtered into the text-books of physiology, which to-day in certain descriptions of the gastric juice and of the phenomena of digestion even the very language of the work is copied.

III. THE VALUE OF BEAUMONT'S OBSERVATIONS.

There had been other instances of artificial gastric fistula in man which had been made the subject of experimental study, but the case of St. Martin stands out from all others on account of the ability and care with which the experiments were conducted. As Dr. Combe says, the value of these experiments consists partly in the admirable opportunities for observation which Beaumont enjoyed, and partly in the candid and truth-seeking spirit in which all his inquiries seem to have been conducted. "It would be difficult to point out any observer who excels him in devotion to truth and freedom from the trammels of theory or prejudice. He tells plainly what he saw and leaves every one to draw his own inferences, or where he lays down conclusions he does so with a degree of modesty and fairness of which few perhaps in his circumstances would have been capable."

To appreciate the value of Beaumont's studies it is necessary to refer for a few moment's to our knowledge of the physiology of digestion in the year 1832, the date of the publication. Take, for example, "The Work on Human Physiology" (published in the very year of the appearance of Beaumont's book), by Dunglison, a man of wide learning and thoroughly informed in the literature of the subject. The five or six old theories of stomach digestion, concoction, putrefaction, trituration, fermentation and maceration, are all discussed, and Wm. Hunter's pithy remark is quoted, "some physiologists will have it, that the stomach is a mill, others, that it is a fermenting vat, others, again, that it is a stew-pan; but, in my view of the matter, it is neither a mill, a fermenting vat nor a stew-pan; but a stomach, gentlemen, a stomach."

The theory of chemical solution is accepted. This had been placed on a sound basis by the experiments of Reaumur, Spallanzani and Stevens, while the studies of Tiedemann and Gmelin and of Prout had done much



ALEXIS ST. MARTIN, AGED 81.



WILLIAM BEAUMONT.

to solve the problems of the chemistry of the juice. But very much uncertainty existed as to the phenomena occurring during digestion in the stomach, the precise mode of action of the juice, the nature of the juice itself and its action outside the body. On all these points the observations of Beaumont brought clearness and light where there had been previously the greatest obscurity.

The following may be regarded as the most important of the results of Beaumont's observations: First, the accuracy and completeness of description of the gastric juice itself. You will all recognize the following quotation, which has entered into the text-books and passes current to-day. "Pure gastric juice, when taken directly out of the stomach of a healthy adult, unmixed with any other fluid, save a portion of the mucus of the stomach with which it is most commonly and perhaps always combined, is a clear, transparent fluid; inodorous; a little saltish, and very perceptibly acid. Its taste, when applied to the tongue, is similar to this mucilaginous water slightly acidulated with muriatic acid. It is readily diffusible in water, wine or spirits; slightly effervesces with alkalies; and is an effectual solvent of the *materia alimentaria*. It possesses the property of coagulating albumen, in an eminent degree; is powerfully antiseptic, checking the putrefaction of meat; and effectually restorative of healthy action, when applied to old, foetid sores and foul, ulcerating surfaces."

Secondly, the confirmation of the observation of Prout that the important acid of the gastric juice was the muriatic or hydrochloric. An analysis of St. Martin's gastric juice were made by Dunglison, at that time a professor in the University of Virginia, and by Benjamin Silliman of Yale, both of whom determined the presence of free hydrochloric acid. A specimen was sent to the distinguished Swedish chemist, Berzelius, whose report did not arrive in time to be included in

the work. In a letter dated July 19, 1834, he writes to Professor Silliman that he had not been able to make a satisfactory analysis of the juice. The letter is published in *Silliman's Journal*, Vol. 27, July, 1835.

Thirdly, the recognition of the fact that the essential elements of the gastric juice and the mucus were separate secretions.

Fourthly, the establishment by direct observation of the profound influence on the secretion of the gastric juice and on digestion of mental disturbances.

Fifthly, a more accurate and fuller comparative study of the digestion in the stomach with digestion outside the body, confirming in a most elaborate series of experiments the older observations of Spallanzani and Stevens.

Sixthly, the refutation of many erroneous opinions relating to gastric digestion and the establishment of a number of minor points of great importance, such as, for instance, the rapid disappearance of water from the stomach through the pylorus, a point brought out by recent experiments, but insisted on and amply proven by Beaumont.

Seventhly, the first comprehensive and thorough study of the motions of the stomach, observations on which, indeed, are based the most of our present knowledge.

And lastly, a study of the digestibility of different articles of diet in the stomach, which remains to-day one of the most important contributions ever made to practical dietetics.

The greater rapidity with which solid food is digested, the injurious effects on the stomach of tea and coffee, when taken in excess, the pernicious influence of alcoholic drinks on the digestion, are constantly referred to. An all-important practical point insisted on by Beaumont needs emphatic reiteration to this generation: "The system requires much less than is generally supplied to it. The stomach disposes of a definite

quantity. If more be taken than the actual wants of the economy require, the residue remains in the stomach and becomes a source of irritation and produces a consequent aberration of function, or passes into the lower bowel in an undigested state, and extends to them its deleterious influence. Dyspepsia is oftener the effect of over-eating and over-drinking than of any other cause."

One is much impressed, too, in going over the experiments, to note with what modesty Beaumont refers to his own work. He speaks of himself as a humble "enquirer after truth and a simple experimenter." "Honest objection, no doubt, are entertained against the doctrine of digestion by the gastric juice. That they are so entertained by these gentlemen I have no doubt. And I cheerfully concede to them the merit of great ingenuity, talents and learning, in raising objections to the commonly received hypothesis, as well as ability in maintaining their peculiar opinions. But we ought not to allow ourselves to be seduced by the ingenuity of argument or the blandishments of style. Truth, like beauty, when 'unadorned is adorned the most'; and in prosecuting these experiments and inquiries, I believe I have been guided by its light. Facts are more persuasive than arguments, however ingeniously made, and by their eloquence I hope I have been able to plead for the support and maintenance of those doctrines which have had for their advocates such men as Sydenham, Hunter, Spallanzani, Richerand, Abernethy, Broussais, Philip, Paris, Bostock, the Heidelberg and Paris professors, Dunglison, and a host of other luminaries in the science of physiology."

In reality Beaumont anticipated some of the most recent studies in the physiology of digestion. Doubtless many of you have heard of Professor Pawlow's, of St. Petersburg, new work on the subject. It has been translated into German, and I see that an English edition is advertised. He has studied the gastric juice in an iso-

lated pouch, ingeniously made at the fundus of the stomach of the dog, from which the juice could be obtained in a pure state. One of his results is the very first announced by Beaumont and confirmed by scores of observations on St. Martin, viz., that, as he says, "the gastric juice never appears to be accumulated in the cavity of the stomach while fasting." Pawlow has shown very clearly that there is a relation between the amount of food taken and the quantity of gastric juice secreted. Beaumont came to the same conclusion: "when aliment is received the juice is given in exact proportion to its requirements for solution." A third point on which Pawlow lays stress is the curve of secretion of the gastric juice, the manner in which it is poured out during digestion. The greatest secretion, he has shown, takes place in the earlier hours. On this point hear Beaumont: "It (the gastric juice) then begins to exude from the proper vessels and increases in proportion to the quantity of aliment naturally required and received." And again: "When a due and moderate supply of food has been received it is probable that the whole quantity of gastric juice for its complete solution is secreted and mixed with it in a short time." A fourth point, worked out beautifully by Pawlow, is the adaptation of the juice to the nature of the food, on which I do not see any reference by Beaumont, but there are no experiments more full than those in which he deals with the influence of exercise, weather and the emotions on the quantity of the juice secreted.

IV. MAN AND DOCTOR.

Sketches of Dr. Beaumont's life have appeared from time to time. There is a worthy memoir by Dr. T. Reyburn in the *St. Louis Medical and Surgical Journal*, 1854, and Dr. A. J. Steele, at the first annual commencement of the Beaumont Medical College, 1887, told well and graphically the story of his life. A few years ago Dr. Frank J. Lutz, of this city, sketched his life

for the memorial meeting of the Michigan State Medical Society on the occasion of the dedication of a Beaumont monument.

Among the papers kindly sent to me by his daughter, Mrs. Keim, are many autobiographical materials, particularly relating to his early studies and to his work as a surgeon in the War of 1812. There is an excellent paper in the handwriting, it is said, of his son, giving a summary of the earlier period of his life. So far as I know this has not been published, and I give it in full:

Dr. William Beaumont was born in the town of Lebanon, Conn., on the 21st day of November, A. D. 1785. His father was a thriving farmer and an active politician of the proud old Jeffersonian school, whose highest boast was his firm support and strict adherence to the honest principles he advocated. William was his third son, who, in the winter of 1806-7, in the 22d year of his age, prompted by a spirit of independence and adventure, left the paternal roof to seek a fortune and a name. His outfit consisted of a horse and cutter, a barrel of cider, and one hundred dollars of hard-earned money. With this he started, laying his course northwardly, without any particular destination, Honor his rule of action, Truth his only landmark, and trust placed implicitly in Heaven. Traversing the western part of Massachusetts and Vermont in the spring of 1807 he arrived at the little village of Champlain, N. Y., on the Canada frontier—an utter stranger, friendless and alone. But honesty of purpose and true energy invariably work good results. He soon gained the people's confidence and was entrusted with their village school, which he conducted about three years, devoting his leisure hours to the study of medical works from the library of Dr. Seth Pomeroy, his first patron. He then went over to St. Albans, Vt., where he entered the office of Dr. Benjamin Chandler and commenced a regular course of medical reading, which he followed for two years, gaining the utmost confidence and esteem of his kind preceptor and friends. About this time the War of 1812 commenced, and he applied for an appointment in the U. S. Army, successfully. He was appointed assistant-surgeon to the Sixth Infantry, and joined his regiment at Plattsburgh, N. Y., on the 13th of September, 1812. On the 19th of March, 1813, he marched from Plattsburgh with the First Brigade, for Sackett's Harbor, where they arrived on the 27th inst. Here he remained in camp till the 22d of April, when he embarked with the troops on Lake Ontario. His journal will best tell this portion of his history:

"April 22, 1813.—Embarked with Captain Humphreys, Wal-

worth and Muhlenburg, and companies on board the Schooner 'Julia.' The rest of the brigade, and the Second, with Foresith's Rifle Regiment and the Eighth Artillery, on board a ship, brig and schooner—remain in the harbor till next morning.

"23d.—11 o'clock a. m.—Weighs anchor and put out under the impression we were going to Kingston. Got out 15 or 20 miles—encountered a storm—wind ahead and the fleet returned to harbor.

"24th.—6 o'clock a. m.—Put out with a fair wind—mild and pleasant—the fleet sailing in fine order.

"26th.—Wind pretty strong—increasing—waves run high, tossing our vessels roughly. At half past four pass the mouth of Niagara river. This circumstance baffles imagination as to where we are going—first impressed with the idea of Kingston—then to Niagara—but now our destination must be 'Little York.' At sunset came in view of York Town and the Fort, where we lay off some 3 or 4 leagues for the night.

"27th.—Sailed into harbor and came to anchor a little below the British Garrison. Filled the boats and effected a landing, though not without difficulty and the loss of some men. The British marched their troops down the beach to cut us off as landing, and, though they had every advantage, they could not effect their design. A hot engagement ensued, in which the enemy lost nearly a third of their men and were soon compelled to quit the field, leaving their dead and wounded strewn in every direction. They retired to the Garrison, but from the loss sustained in the engagement, the undaunted courage of our men, and the brisk firing from our fleet, with the 12 and 32 pounders, they were soon obliged to evacuate it and retreat with all possible speed.—Driven to this alternative they devised the inhuman project of blowing up their magazine, containing 300 pounds of powder, the explosion of which had well-nigh destroyed our army. Over 300 were wounded and about 60 killed on the spot, by stones of all dimensions falling, like a shower of hail, in the midst of our ranks. A most distressing scene ensues in the hospital. Nothing is heard but the agonizing groans and supplications of the wounded and the dying. The surgeons wade in blood cutting off arms and legs and trepaning heads, while the poor sufferers cry, 'O, my God! Doctor, relieve me from this misery! I can not live!' 'Twas enough to touch the veriest heart of steel and move the most relentless savage. Imagine the shocking scene, where fellow-beings lie mashed and mangled—legs and arms broken and sundered—heads and bodies bruised and mutilated to disfigurement! My deepest sympathies were roused—I cut and slashed for 36 hours without food or sleep.

"29th.—Dressed upwards of 50 patients—from simple contusions to the worst of compound fractures—more than half the latter. Performed two cases of amputation and one of trepaning. At 12 p. m. retired to rest my fatigued body and mind."

One month after the taking of York he witnessed the storming of Fort George. The troops were transported from York to "Four-Mile Creek" (in the vicinity of Ft. George), where they encamped from the 10th of May to the 27th, when they advanced to the attack. His journal runs thus:

"May 27 (1813).—Embarked at break of day—Col. Scott with 800 men, for the advanced guard, supported by the First Brigade, commanded by General Boyd, moved in concert with the shipping to the enemy's shore and landed under their battery and in front of their fire with surprising success, not losing more than 30 men in the engagement, though the enemy's whole force was placed in the most advantageous situation possible. We routed them from their chosen spot—drove them from the country and took possession of the town and garrison."

On the 11th of September, 1814, he was at the Battle of Plattsburgh, still serving as assistant-surgeon, though doing all the duty of a full surgeon. At the close of the war, in 1815, when the Army was cut down, he was retained in service, but resigned soon after, deeming himself unjustly treated by the government in having others, younger and less experienced, promoted over him.

In 1816 he settled in Plattsburgh and remained there four years in successful practice. In the meantime his army friends had persuaded him to join the service again, and, having applied, he was reappointed, in 1820, and ordered to Ft. Mackinac as post surgeon. At the end of the first year he obtained leave of absence, returned to Plattsburgh and married one of the most amiable and interesting ladies of that place. (She still survives her honored husband, and in her green old age is loved devotedly by all who know her.) He returned to Mackinac the same year, and in 1822 came in possession of Alexis St. Martin, the subject of his "Experiments on the Gastric Juice." By the accidental discharge of his gun, while hunting, St. Martin had dangerously wounded himself in the abdomen and came under the treatment of Dr. Beaumont, who healed the wound (in itself a triumph of skill almost unequalled) and in 1825 commenced a series of experiments, the results of which have a world-wide publication. These experiments were continued, with various interruptions, for eight years, during which time he was ordered from post to post—now at Niagara, N. Y., anon as Green Bay, Mich., and finally at Fort Crawford, on the Mississippi. In 1834 he was ordered to St. Louis, where he remained in service till 1839, when he resigned. He then commenced service with the citizens of St. Louis, and from that time till the period of his last illness, enjoyed an extensive and distinguished practice, interrupted only by the base attacks of a few disgraceful and malicious knaves (self-deemed members of the medical profession) who sought to destroy a reputation which they could not share.

They gained nothing except some little unenviable notoriety and they have skulked away like famished wolves, to die in their hiding places.

The dates of Beaumont's commissions in the army are as follows: Surgeon's Mate, Sixth Regiment of Infantry, Dec. 2, 1812; Cavalry, March 27, 1819; Post Surgeon, Dec. 4, 1819; Surgeon First Regiment and Surgeon, Nov. 6, 1826.

From the biographical sketches of Reyburn, Steele and Lutz, and from the personal reminiscences of his friends, Drs. J. B. Johnson, S. Pollak and Wm. McPheeters, who fortunately remains with you, full of years and honors, we gather a clearly-defined picture of the latter years of his life. It is that of a faithful, honest, hard-working practitioner, doing his duty to his patients, and working with zeal and ability for the best interests of the profession. The strong common sense which he exhibited in his experimental work made him a good physician and a trusty adviser in cases of surgery. Among his letters there are some interesting pictures of his life, particularly in his letters to his cousin, Dr. Samuel Beaumont. Writing to him April 4, 1846, he says:

I have a laborious, lucrative and increasing practice, more than I can possibly attend to, though I have an assistant, Dr. Johnson, a young man who was a pupil of mine from 1835 to 1840. He then went to Philadelphia a year or two to attend lectures, and graduated, and returned here again in 1842, and has been very busy ever since and is so now, but notwithstanding I decline more practice daily than half the doctors in the city get in a week. You thought when you were here before that there was too much competition for you ever to think of succeeding in business here—there is ten times as much now and the better I succeed and prosper for it. You must come with a different feeling from your former—with a determination to follow in my wake and stem the current that I will break for you. I am now in the grand climacteric of life, three-score years and over, with equal or more zeal and ability to do good and contribute to professional service than at forty-five, and I now look forward with pleasing anticipation of success and greater usefulness—have ample competence for ourselves and children, and no doleful or dreaded aspect of the future—to be sure I have to wrestle with some adverse circumstances of

life, and more particularly to defend myself against the envious, mean and professional jealousies and the consequent prejudices of some men, but I triumph over them all and go ahead in defiance of them.*

His professional work increased enormously with the rapid growth of the city, but he felt, even in his old age, that delicious exhilaration which it is your pleasure and privilege to enjoy here in the west in a degree rarely experienced by your eastern confrères. Here is a cheery paragraph from a letter dated Oct. 20, 1852: "Domestic affairs are easy, peaceable and pleasant. Health of community good—no severe epidemic diseases prevalent—weather remarkably pleasant—business of all kinds increasing—product of the earth abundant—money plenty—railroads progressing with almost telegraphic speed—I expect to come to Plattsburgh next summer all the way by rail."

But work was becoming more burdensome to a man nearing threescore years and ten, and he expresses it in another letter when he says: "There is an immense professional practice in this city. I get tired of it, and have been trying hard to withdraw from it altogether, but the more I try the tighter I seem to be held to it by the people. I am actually persecuted, worried and almost worn out with valetudinarian importunities and hypochondriacal groans, repinings and lamentations—Amen."

He continued at work until March, 1853, when he had an accident—a fall while descending some steps. A few weeks later a carbuncle appeared on the neck, and proved fatal April 25. One who knew him well wrote the following estimate (quoted by Dr. F. J. Lutz in his sketch of Beaumont):

"He was gifted with strong natural powers, which working upon an extensive experience in life, resulted in a species of natural sagacity, which, as I suppose,

* He had evidently hopes that when his cousin and son arrived with Alexis they would arrange and plan for another series of experiments and in another year or two make another book, better than the old one.

was something peculiar in him, and not to be attained by any course of study. His temperament was ardent, but never got the better of his instructed and disciplined judgment, and whenever or however employed, he ever adopted the most judicious means for attaining ends that were always honorable. In the sick room, he was a model of patience and kindness, his intuitive perceptions, guiding a pure benevolence, never failed to inspire confidence, and thus he belonged to that class of physicians whose very presence affords Nature a sensible relief."

You do well, citizens of St. Louis and members of our profession, to cherish the memory of William Beaumont. Alive you honored and rewarded him, and there is no reproach against you of neglected merit and talents unrecognized. The profession of the northern part of the state of Michigan has honored itself in erecting a monument to his memory near the scene of his disinterested labors in the cause of humanity and science. His name is linked with one of your educational institutions, and joined with that of a distinguished laborer in another field of practice. But he has a far higher honor than any you can give him here—the honor that can only come when the man and the opportunity meet—and match. Beaumont is the pioneer physiologist of this country, the first to make an important and enduring contribution to this science. His work remains a model of patient, persevering investigation, experiment and research, and the highest praise we can give him is to say that he lived up to and fulfilled the ideals with which he set out and which he expressed when he said: "Truth, like beauty, when 'unadorned, is adorned the most,' and, in prosecuting these experiments and enquiries, I believe I have been guided by its light."

APPENDIX A.

The Beaumont papers in the possession of his daughter, Mrs. Keim of St. Louis, consist of (1) interesting certificates from his preceptors, Dr. Pomeroy and Dr. Chandler, the license from the Third Medical Society of Vermont, the commissions in the

U. S. Army, several certificates of honorary membership in societies, and the parchment of the M.D. degree conferred upon him, *honoris causa*, by the Columbian University of Washington, 1833; (2) a journal containing his experiences in the War of 1812, from which I give an extract, a journal of his trip to Fort Mackinac, a journal containing the reports of many cases, among them that of St. Martin (in addition there is a protocol of the case in loose folio sheets), a journal of the experiments, and a commonplace book of receipts and jottings; (3) an extensive correspondence relating to St. Martin and the book, and many rough drafts of sections of the book; (4) a large mass of personal correspondence, much of it of interest as relating to conditions of practice in St. Louis.

The picture reproduced here in his army uniform is from a miniature; the picture which has been previously reproduced is of an older man from a daguerreotype. It is satisfactory to know that the ultimate destination of this most valuable collection of papers is the Surgeon-General's Library of the United States Army, of which Dr. Beaumont was so distinguished an ornament.

APPENDIX B.

On Oct. 20, 1853, he writes to his cousin, Dr. Samuel Beaumont, on the subject of "that old, fistulous Alexis," as he calls him. "Alexis' answer to yours is the very fac-simile or stereotype of all his Jesuitical letters to me for the last fifteen years. His object seems only to be to get a heavy bonus and undue advance from me and then disappoint and deceive me, or to palm and impose himself and whole family upon me for support for life.

"I have evaded his designs so far; but I verily fear that the strong and increasing impulse of conscious conviction of the great benefits and important usefulness of further and more accurate physiological investigation of the subject will compel me to still further efforts and sacrifices to obtain him. Physiological authors and most able writers on dietetics and gastric functions generally demand it of me in trumpet tones.

"I must have him at all hazards, and obtain the necessary assistance to my individual and private efforts or transfer him to some competent scientific institution for thorough investigation and report—I must retrieve my past ignorance, imbecility and professional remissness of a quarter of a century, or more, by double diligence, intense study and untiring application of soul and body to the subject before I die—

Should posthumous Time retain my name,
Let historic truths declare my fame.

"Simultaneous with this I write to Mr. Morrison and Alexis my last and final letters—perhaps, proposing to *him*, as bribe to his cupidity, to give him \$500 to come to me *without* his family, for one year—\$300 of them for his salary, and \$200

for the support and contentment of his family to remain in Canada in the meantime—with the privilege of bringing them on here another year, upon my former proposition of \$300 a year, at his own expense and responsibility and support them himself after they get here out of his \$300 salary—I think he will take the bait and come on this fall, and when I get him alone again into my keeping and engagement, I will take good care to control him as I please.”

APPENDIX C.

Letter from Dr. Andrew Combe, May 1, 1838:

“My Dear Sir—May I beg your acceptance of the accompanying volumes as a small expression of my respect for your character and scientific labors. I need not detain you by repeating in this note the high estimation in which I hold you. The volumes herewith sent will, I trust, convince you of the fact, and that it will not be my fault if you do not receive the credit justly due to your valuable and disinterested services. I remain, My Dear Sir,

Very respectfully yours,

“ANDW. COMBE.”

APPENDIX D.

Letter from Dr. Samuel Beaumont, March 16, 1846:

“Your letter of the 1st of February arrived here in the course of mail, and I have attended to the business which you authorized me to do. I am afraid, however, that you will be disappointed, and perhaps dissatisfied with the arrangement. Mr. Goodrich came here some five or six days after I received your letter, and made his proposal, which was to give you every tenth copy for the privilege of publishing an edition. The number he proposed to publish was fifteen hundred, which would give you 150 copies. I did not like to close the bargain on this condition, and he was not disposed to give any more. This was in the evening. I told him to give me time till the next morning, and I would make up my mind. In the morning, after consultation, I concluded to offer him the copyright for the unexpired time (only one year) for two hundred copies. After some demurring, we closed the bargain. I then thought and I still think it was not enough; but it was all I could get. In making up my mind the following considerations presented themselves: First, that the copyright would expire in one year, and he would then have the right to print it without consulting the author; second, that it would be somewhat mortifying to the author not to have his work republished, even if no great pecuniary benefit was to be obtained by such a republication; and it appeared to me to be quite certain that a new edition would not be soon printed, if I let this opportunity slip; third, I have been long anxious, as I presume you have been, to see the work gotten up in a better dress than it originally had, and in a way which will give it a general credit

and more notoriety among all classes of the reading public than it has heretofore possessed—in fact, make it a standard work; fourth, it has given us a chance to give it a thorough correction, a thing which was very desirable. The work, you recollect, was got up in a great hurry, and a great many errors escaped our notice. You may also recollect that the Philadelphia reviewer spoke of the inaccuracies in the work. And he had reason enough for it. In looking over the work critically with a view of correction, I have been perfectly astonished at the errors that occur on almost every page. And although we understood perfectly what we meant to say, the reader would find it somewhat difficult to decipher our meaning. In the first 140 pages I made nearly 300 corrections. These are practically merely verbal alterations or change of phrases or sentences so as to make them more accurate or perspicuous. I have in no case so changed the text as to give it a different meaning. I flatter myself that it will now be more worthy the public patronage; and if for no other, this chance for correction I consider alone almost a sufficient remuneration for the brief limits of the copyright. I have also written a preface for the second edition, making quotations from American and European authorities in praise of the merits of the work. From delicacy I have written this as from the publisher. I think it is pretty well done. The work will probably be published in the course of about a month, and those designed for you will be delivered to me, when I shall send them to you. He guarantees not to sell in the state of Missouri, or the states south and west of that state. But that, of course, is all gammon. The book will be thrown into market, and he can not control the direction in which it will go.”

On the Educational Value of the Medical Society

BY

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ON THE EDUCATIONAL VALUE OF THE MEDICAL SOCIETY.¹

BY WILLIAM OSLER, M.D., BALTIMORE, MD.,

Professor of Medicine, Johns Hopkins University.

As the Autocrat remarks :

“ Little of all we value here
Wakes on the morn of its hundredth year.”

All the more reason to honor such occasions as the present in an appropriate manner. The tribute of words that I gladly bring — and that you may take as expressing the sentiments of your brethren at large — necessarily begins with congratulations that your society has passed into the select group of those that have reached a century of existence. But congratulations must be mingled with praise of the band of noble men who, in 1803, made this gathering possible. It is true they did but follow the lead of their colleagues of Litchfield County and their own example when, in 1784, the physicians of this county organized what is now one of the oldest medical societies in the land. In the introduction to the volume of “Transactions of this Society,” published in 1788, the following brief statements are made as to the objects of the organization, which may be transposed from the parent to the child, and which I quote in illustration of the character of the men and as giving in brief the chief uses of a medical society: “This society was formed on the most liberal and generous principles, and was designed first to lay a foundation for that unanimity and friendship which is essential

¹ Remarks made on the occasion of the centennial celebration of the New Haven Medical Association, New Haven, Jan. 6, 1903.

to the dignity and usefulness of the profession ; to accomplish which, they resolved, secondly, to meet once in three months ; thirdly, that in all cases where counsel is requisite they will assist each other without reserve ; fourthly, that all reputable practitioners in the county, who have been in the practice for one year or more, may be admitted members ; fifthly, that they will communicate their observations on the air, seasons and climate, with such discoveries as they may make in physic, surgery, botany or chemistry, and deliver faithful histories of the various diseases incident to the inhabitants of this country, with the mode of treatment and event in singular cases ; sixthly, to open a correspondence with the medical societies in the neighboring states and in Europe, for which purpose they have a standing committee of correspondence ; seventhly, to appoint a committee for the purpose of examining candidates for the profession, and to give certificates to the deserving." Changed conditions have changed some of these objects, but in the main they hold good today.

Some of the paragraphs have suggested to me the subject of my address — the educational value of the medical society. There are many problems and difficulties in the education of a medical student, but they are not more difficult than the question of the continuous education of the general practitioner. Over the one we have some control, over the other, none. The university and the state board make it certain that the one has a minimum, at least, of professional knowledge, but who can be certain of the state of that knowledge of the other in five or ten years from the date of his graduation? The specialist may be trusted to take care of himself — the conditions of his existence demand that he shall be abreast of the times ; but the family doctor, the private in our great army, the essential factor in the battle, should be

carefully nurtured by the schools and carefully guarded by the public. Humanly speaking, with him are the issues of life and death, since upon him falls the grievous responsibility in those terrible emergencies which bring darkness and despair to so many households. No class of men needs to call to mind more often the wise comment of Plato that education is a life-long business. The difficulties are partly adherent to the subject, partly have to do with the individual and his weakness. The problems of disease are more complicated and difficult than any others with which the trained mind has to grapple; the conditions in any given case may be unlike those in any other; each case, indeed, may have its own problem. Law, constantly looking back, has its forms and procedures, its precedents and practices. Once grasped, the certainties of divinity make its study a delight and its practice a pastime; but who can tell of the uncertainties of medicine as an art? The science on which it is based is accurate and definite enough; the physics of a man's circulation are the physics of the water works of the town in which he lives, but once out of gear, you cannot apply the same rules for the repair of the one as of the other. Variability is the law of life, and as no two faces are the same, so no two bodies are alike, and no two individuals react alike and behave alike under the abnormal conditions which we know as disease. This is the fundamental difficulty in the education of the physician, and one which he may never grasp, or he takes it so tenderly that it hurts instead of boldly accepting the axiom of Bishop Butler, more true of medicine than of any other profession: "Probability is the guide of life." Surrounded by people who demand certainty, and not philosopher enough to agree with Locke that *"Probability supplies the defect of our knowledge and guides us when that fails and is always conner-*

sant about things of which we have no certainty," the practitioner too often gets into a habit of mind which resents the thought that opinion, not full knowledge, must be his stay and prop. There is no discredit, though there is at times much discomfort, in this everlasting *perhaps* with which we have to preface so much connected with the practice of our art. It is, as I said, inherent in the subject. Take in illustration an experience of last week. I saw a patient with Dr. Bolgiano who presented marked pulsation to the left of the sternum in the second, third and fourth interspaces, visible even before the night-dress was removed, a palpable impulse over the area of pulsation, flatness on percussion, accentuated heart sounds and a soft systolic bruit. When to this were added paralysis of the left recurrent laryngeal nerve, smallness of the radial pulse on the left side and tracheal tugging, there is not one of you who would not make, under such circumstances, the diagnosis of aneurism of the aorta. Few of us, indeed, would put in the *perhaps*, or think of it as a probability with such a combination of physical signs, and yet the associate conditions which had been present — a small primary tumor of the left lobe of the thyroid, with secondary nodules in the lymph glands of the neck and involvement of the mediastinum and metastases in the brain with optic neuritis — left no question that the tumor causing the remarkable intrathoracic combination was not aneurismal but malignant. Listen to the appropriate comment of the Father of Medicine, who twenty-five years ago had not only grasped the fundamental conception of our art as one based on observation, but had labored also through a long life to give to the profession which he loved the saving health of science — listen, I say, to the words of his famous aphorism: "*Experience is fallacious and judgment difficult!*"

But the more serious problem relates to the edu-

cation of the practitioner after he has left the schools. The foundation may not have been laid upon which to erect an intellectual structure, and too often the man starts with a total misconception of the prolonged struggle necessary to keep the education he has, to say nothing of bettering the instruction of the schools. As the practice of medicine is not a business and can never be one,² the education of the heart — the moral side of the man — must keep pace with the education of the head. Our fellow creatures cannot be dealt with as man deals in corn and coal; “the human heart by which we live” must control our professional relations. After all, the personal equation has most to do with success or failure in medicine, and in the trials of life the fire which strengthens and tempers the metal of one may soften and ruin another. In his philosophy of life the young doctor will find Rabbi Ben Ezra³ a better guide, with his stimulating

“Then, welcome each rebuff
That turns earth’s smoothness rough,
Each sting that bids nor sit, nor stand but go!”

than Omar, whose fatalism, so seductive in Fitzgerald’s verses, leaves little scope for human effort.

For better or worse, there are few occupations

² In every age there have been Elijahs ready to give up in despair at the progress of commercialism in the profession. Garth says in 1699 (*Dispensary*),

“How sickening Physick hangs her pensive head
And what was once a Science, now ’s a Trade.”

Of medicine, many are of the opinion expressed by one of Aken-side’s disputants at Tom’s Coffee House, that the ancients endeavored to make it a science and failed, and the moderns to make it a trade and have succeeded. Today the cry is louder than ever, and in truth there are grounds for alarm; but, on the other hand, we can say to these Elijahs that there are many more than 7,000 left who have not bowed the knee to this Baal, but who practice *caute caste et probe*.

³ See Browning’s poem. A good little edition has just been issued (with an introduction by William Adams Slade) which I commend to young graduates.

of a more satisfying character than the practice of medicine, if a man can but once get orientirt and bring to it the philosophy of honest work, the philosophy which insists that we are here, not to get all we can out of the life about us, but to see how much we can add to it. The discontent and grumblings which one hears have their source in the man more often than in his environment. In the nature of the material in which we labor and of which, by the way, we are partakers, there is much that could be improved, but, as Mrs. Poyser remarks, we must accept men as the Lord made them, and not expect too much. But let me say this of the public: it is rarely responsible for the failures in the profession. Occasionally a man of superlative merit is neglected, but it is because he lacks that most essential gift, the knowledge how to use his gifts. The failure in 99% of the cases is in the man himself; he has not started right, the poor chap has not had the choice of his parents, or his education has been faulty, or he has fallen away to the worship of strange gods, Baal or Ashtoreth, or worse still, Bacchus. But after all the killing vice of the young doctor is intellectual laziness. He may have worked hard at college, but the years of probation have been his ruin. Without specific subjects upon which to work, he gets the newspaper or the novel habit, and fritters his energies upon useless literature. There is no greater test of a man's strength than to make him mark time in the "stand and wait" years. Habits of systematic reading are rare, and are becoming more rare, and five or ten years from his license, as practice begins to grow, may find the young doctor knowing less than he did when he started and without any fixed educational purpose in life.

Now here is where the medical society may step in and prove his salvation. The doctor's post-grad-

uate education comes from patients, from books and journals and from societies, which should be supplemented every five or six years by a return to a post-graduate school to get rid of an almost inevitable slovenliness in methods of work. Of his chief teachers, his patients, I cannot here speak. Each case has its lesson — a lesson that may be, but is not always, learnt, for clinical wisdom is not the equivalent of experience. A man who has seen 500 cases of pneumonia may not have the understanding of the disease which comes with an intelligent study of a score of cases, so different are knowledge and wisdom, which, as the poet truly says, “far from being one have ofttimes no connection.” Nor can I speak of his books and journals, but on such an occasion as the present it seems appropriate to say a few words on the *educational value of the medical society*.

The first, and in some respects the most important, function is that mentioned by the wise founders of your parent society — to lay a foundation for that unity and friendship which is essential to the dignity and usefulness of the profession. Unity and friendship! How we all long for them, but how difficult to attain! Strife seems rather to be the very life of the practitioner, whose warfare is incessant against disease and against ignorance and prejudice, and, sad to have to admit, he too often lets his angry passions rise against his professional brother. The quarrels of doctors make a pretty chapter in the history of medicine. Each generation seems to have had its own. The Coans and the Cnidians, the Arabians and the Galenists, the humoralists and the solidists, the Brunonians and the Broussaisians, the homeopaths and the regulars, have, in different centuries, rent the robe of Æsculapius. But these larger quarrels are becoming less and less intense, and in the last century no new one of moment sprang up, while it is easy

to predict that in the present century, when science has fully leavened the dough of homeopathy, the great breach of our day will be healed.⁴ But in too many towns and smaller communities miserable factions prevail and bickerings and jealousies mar the dignity and usefulness of the profession. So far as my observation goes, the fault lies with the older men. The young fellow, if handled aright and made to feel that he is welcomed and not regarded as an intruder to be shunned, is only too ready to hold out the hand of fellowship. The society comes in here as professional cement. The meetings in a friendly social way lead to a free and open discussion of differences in a spirit that refuses to recognize differences of opinion on the non-essentials of life as a cause of personal animosity or ill feeling. An attitude of mind habitually friendly, more particularly to the young man, even though you feel him to be the David to whom your kingdom may fall, a little of the old-fashioned courtesy which makes a man shrink from wounding the feelings of a brother practitioner,—in honor preferring one another; with such a spirit abroad in the society and among its older men, there is no room for envy, hatred, malice or any uncharitableness. It is the confounded tales of patients that so often set us by the ears, but if a man makes it a rule never under any circumstances to believe a story told by a patient to the detriment of a fellow-practitioner,—even if he knows it to be true!—and though the measure he metes may not be measured to him again, he will have the satisfaction of knowing that he has closed the ears of his

⁴ As an indication of the leaven which is at work in our brethren of the homeopathic school, I may call your attention to the work on Clinical Medicine (Diagnosis), by Dr. Clarence Bartlett of the Hahnemann Medical College, Philadelphia. Accurate, thoroughly scientific and fully up to date, the students fed on such a diet will not be content with the husks of Hahnemann any more than the students of our regular schools are with the husks of Brown or Broussais, but they will practise as rational physicians, untrammelled by the shibboleth of any school.

soul to ninety-nine lies, and to have missed the hundredth truth will not hurt him. Most of the quarrels of doctors are about non-essential, miserable trifles and annoyances, — the pin pricks of practice, — which would sometimes try the patience of Job, but the good-fellowship and friendly intercourse of the medical society should reduce these to a minimum.

The well-conducted medical society should represent a clearing house, in which every physician of the district would receive his intellectual rating, and in which he could find out his professional assets and liabilities. We doctors do not “take stock” often enough, and are very apt to carry on our shelves stale, out-of-date goods. The society helps to keep a man “up to the times,” and enables him to refurnish his mental shop with the latest wares. Rightly used, it may be a touch-stone to which he can bring his experiences to the test and save him from falling into the rut of a few sequences. It keeps his mind open and receptive, and counteracts that tendency to premature senility which is apt to overtake a man who lives in a routine. Upon one or two specially valuable features of the society I may dwell for a moment or two.

In a city association the demonstration of instructive specimens in morbid anatomy should form a special feature of the work. After all has been done, many cases of great obscurity in our daily rounds remain obscure, and as postmortems are few and far between, the private practitioner is at a great disadvantage, since his mistakes in diagnosis are less often corrected than are those of hospital physicians. No more instructive work is possible than carefully demonstrated specimens illustrating disturbance of function and explanatory of the clinical symptoms. It is hard in this country to have the student see enough morbid anatomy,

the aspects of which have such an important bearing upon the mental attitude of the growing doctor. For the crass therapeutic credulity, so widespread today, and upon which our manufacturing chemists wax fat, there is no more potent antidote than the healthy scepticism bred of long study in the post-mortem room. The new pathology, so fascinating and so time-absorbing, tends, I fear, to grow away from the old morbid anatomy, a training in which is of such incalculable advantage to the physician. It is a subject which one must learn in the medical school, but the time assigned is rarely sufficient to give the student a proper grasp of the subject. The younger men should be encouraged to make the exhibition of specimens part of the routine work of each meeting. Something may be learned from the most ordinary case if it is presented with the special object of illustrating the relation of disturbed function to altered structure. Of still greater educational value is the clinical side of the society. No meeting should be arranged without the presentation of patients, particularly those illustrating rare and unusual forms of disease. Many diseases of the skin and of the joints, a host of nervous affections, and many of the more remarkable of general maladies, as myxedema, cretinism, achondroplasia, etc., are seen so rarely and yet are so distinctive, requiring only to be seen to be recognized, that it is incumbent upon members to use the society to show such cases. A clinical evening devoted to these rarer affections is of very great help in diffusing valuable knowledge. The importance of a clinical demonstration was never better illustrated than at the International Congress in London in 1881, when Dr. Ord and others presented one morning at the Clinical Museum a group of cases of myxedema. There were men from all parts of the world, and the general recognition of the disease outside of England dates

from that meeting. The physiognomy of disease is learned slowly, and yet there are a great many affections which can be recognized, sometimes at a glance, more often by careful inspection, without any history. The society should be a school in which the scholars teach each other, and there is no better way than by the demonstration of the more unusual cases that happen to fall in your way. I have gone over my history cards of private patients brought or sent to me by last-year physicians, in which the disease was not diagnosed though recognisable *de visu*. Gout, pseudo-hypertrophic muscular paralysis, hysterical lordosis, spondylitis deformans, preataxic tabes (myosis, ptosis, etc.), Graves' disease, Parkinson's disease, anorexia nervosa, Raynaud's disease, pernicious anemia, spastic diplegia, spastic hemiplegia and cyanosis of chronic emphysema were on the list. Some of these are rare diseases, but at an active society in the course of a few years every one of them could be demonstrated.

The presentation of the histories of cases may be made very instructive, but this is often a cause of much weariness and dissatisfaction. A brief oral statement of the special features of a case is much to be preferred to a long, written account. The protocol or daily record of a long case should never be given in full. The salient points should be brought out, particularly the relation the case bears to the known features of the disease and to diagnosis and treatment. The volume of the Transactions of the New Haven County Medical Society, 1788, contains many admirably reported cases. I select one for special comment, as it is, so far as I know, the first case on record of a most remarkable disease, to which much attention has been paid of late, — the hypertrophic stenosis of the pylorus in children (see full discussion in the *Lancet* of Dec. 20, 1902). Dr. Hezekiah Beardsley reports a *Case of*

Schirrhous of the Pylorus of an Infant. Every feature of the disease as we know it now is noted — the constant puking, the leanness, the wizened, old look of the child are well described, and the diagnosis was made four months before death! The postmortem showed a dilated and hypertrophied stomach and “the pylorus was invested with a hard, compact substance or schirrosity which so completely obstructed the passage into the duodenum as to admit with the greatest difficulty the finest fluid.” If other men had been as accurate and careful as Dr. Beardsley, and if other societies had followed the good example set so early by the New Haven County Medical Association, not only would this rare disease have been recognized, but by the accumulation of accurate observations many another disease would have yielded its secret. But it illustrates the old story — there is no more difficult art to acquire than the art of observation, and for some men it is quite as difficult to record an observation in brief and plain language.

In no way can a society better help in the education of its members than in maintaining for them a good library, and I am glad to know that this is one of your functions. It is most gratifying to note the growing interest in this work in all parts of the country. In the last number of the *Bulletin* of the Association of Medical Librarians there is a list of twenty-five societies with medical libraries. An attractive reading-room, with the important weekly journals, and with shelves stocked with the new books in different departments, becomes an educational center in which the young man can keep up his training and to which the older practitioner can go for advice when he is in despair and for reassurance, when he is in doubt. The self-sacrifice necessary to establish and maintain such a library does good to the men who take part in it; harmony is promoted, and, in the words of your fathers, the

dignity and usefulness of the profession are maintained.

Why is it that a large majority of all practitioners are not members of a medical society? Dr. Simmons estimates that there are 77,000 physicians in the United States who do not belong to any medical society whatever! In part this is due to apathy of the officers and failure to present an attractive program, but more often the fault is in the men. Perhaps given over wholly to commercialism a doctor feels it a waste of time to join a society, and so it is if he is in the profession only for the money he can get out of patients without regard to the sacred obligation to put himself in the best possible position to do the best that is known for them. More frequently, I fear, the "dollar-doctor" is a regular frequenter of the society, knowing full well how suicidal in the long run is isolation from the general body of the profession. The man who knows it all and gets nothing from the society reminds one of that little dried-up miniature of humanity, the prematurely senile infant, whose tabetic marasmus has added old age to infancy. Why should he go to the society and hear Dr. Jones on the gastric relations of neurasthenia when he can get it all so much better in the works of Einhorn or Ewald. He is weary of seeing appendices, and there are no new pelvic viscera for demonstration. It is a waste of time, he says, and he feels better at home, and perhaps that is the best place for a man who has reached this stage of intellectual stagnation.

Greater sympathy must be felt for the man who has started all right and has worked hard at the societies, but as the rolling years have brought ever-increasing demands on his time, the evening hours find him worn out yet not able to rest, much less to snatch a little diversion or instruction in the company of his fellows whom he loves so well. Of

all men in the profession the forty-visit-a-day man is the most to be pitied. Not always an automaton, he may sometimes by economy of words and extraordinary energy do his work well, but too often he is the one above all others who needs the refreshment of mind and re-creation that is to be had in a well-conducted society. Too often he is lost beyond all recall, and, like Ephraim joined to his idols, we may leave him alone. Many good men are ruined by success in practice, and need to pray the prayer of the Litany against the evils of prosperity. It is only too true, as you know well, that a most successful—as the term goes—doctor may practice with a clinical slovenliness that makes it impossible for that kind old friend, Dame Nature, to cover his mistakes. A well-conducted society may be of the greatest help in stimulating the practitioner to keep up habits of scientific study. It seems a shocking thing to say, but you all know it to be a fact that many, very many men in large practice never use a stethoscope, and as for a microscope, they have long forgotten what a leucocyte or a tube cast looks like. This in some cases may be fortunate, as imperfect or half knowledge might only lead to mistakes, but the secret of this neglect of means of incalculable help is the fact that he has not attained the full and enduring knowledge which should have been given to him in the medical school. It is astonishing with how little outside aid a large practice may be conducted, but it is not astonishing that in it cruel and unpardonable mistakes are made. At whose door so often lies the responsibility for death in cases of empyema but at that of the busy doctor, who has not time to make routine examinations, or who is “so driven” that the urine of his scarlet fever or puerperal patients is not examined until the storm has broken?

But I hear it sometimes said you cannot expect

the general practitioner, particularly in country districts, to use the microscope and the stethoscope — these are refinements of diagnosis. They are not! They are the essential means which can be used and should be used by every intelligent practitioner. In our miserable, antiquated system of teaching we send our graduates out wholly unprepared to make a rational diagnosis, but a man who is in earnest — and, thank heaven! most of the young men today in the profession are in earnest — can supply the defects in his education by careful study of his cases, and can supplement the deficiency by a post-graduate course. A room fitted as a small laboratory, with the necessary chemicals and a microscope, will prove a better investment in the long run than a static machine or a new-fangled air-pressure spray apparatus.

It is not in the local society only that a man can get encouragement in his day's work and a betterment of mind and methods. Every practitioner should feel a pride in belonging to his state society, and should attend the meetings whenever possible, and gradually learn to know his colleagues, and here let me direct your attention to an important movement on the part of the American Medical Association, which has for its object the organization of the profession throughout the entire country. This can be accomplished only by a uniformity in the organization of the state societies, and by making the county society the unit through which members are admitted to the state and national bodies. Those of you interested will find very instructive information on this subject in the *Journal* of the association in a series of papers by Dr. Simmons, the editor, which have been reprinted in pamphlet form. As now managed, with active sections conducted by good men from all parts of the country, the meeting of the National Association is in itself a sort of brief post-graduate course. Those of you

at the receptive age who attended the Saratoga meeting last June must have been impressed with the educational value of such a gathering. The Annual Museum was itself an important education in certain lines, and the papers and discussions in the various sections were of the greatest possible value. But I need say no more to this audience on the subject of medical societies; you of New England have not "forsaken the gathering of yourselves together as the manner of some is," but have been an example to the whole country.

In the dedication of his "Holy War," Thomas Fuller has some very happy and characteristic remarks on the bounden duty of a man to better his heritage of birth or fortune, and what the father found glass and made crystal, he urges the son to find crystal and make pearl. Your heritage has been most exceptional, and, I believe, from all that I know of the profession in this city and State, that could your fathers return they would say that of their crystal you had made pearl. One cannot read their history as told by Bronson, or as sketched by your distinguished citizen, my colleague, Dr. Welch, without a glow of admiration for their lofty ideals, their steadfastness and devotion, and for their faith in the profession which they loved. The times have changed, conditions of practice have altered and are altering rapidly, but when such a celebration takes us back to your origin in simpler days and ways, we find that the ideals which inspired them are ours today — ideals which are ever old, yet always fresh and new, and we can truly say in Kipling's words:

"The men bulk big on the old trail, our own trail, the out trail,
They're God's own guides on the Long Trail, the trail that is always new."

ON OBLITERATION OF THE SUPERIOR VENA CAVA.

BY WILLIAM OSLER, M. D.,

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BY WILLIAM OSLER, M. D.,

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While signs of compression of the superior vena cava are [169] not very uncommon in cases of aneurism of the aorta and in mediastinal tumors, instances of complete obliteration of the vessel, with the establishment of collateral circulation, are extremely rare. I here report one case which was under our observation for nearly three years, long enough to make the diagnosis of fibroid obliteration by exclusion, and a second in which the obliteration was due to compression in Hodgkin's disease. A third case due to aneurism I have already reported.¹

Dr. Hume has collected for me from the literature the histories of 29 cases of complete obliteration of this vessel. Many of the reports are imperfect, and only the anatomical record is given. Of the cases 13 were males, 12 females and in 4 the sex was not specified. Eighteen of the patients were between the ages of 30 and 60. So far as the cause could be ascertained the cases could be grouped as follows: I. Thrombosis due to disease within the vein, 10 cases. Of these, 8 seem to have been due to a simple phlebitis; one, the case of Duchek, was a propagated thrombus from the periphery, and one a remarkable case of tuberculosis endophlebitis (Banti). By far the largest number of cases were due to: II. Disease outside the vein, 19 cases, grouped as follows: (a) tuberculosis, 4 cases; (b) mediastinitis, 4 cases; (c) aneurism, 4 cases; (d) syphilis, 3 cases; (e) periaortitis, 2 cases; (f) carcinoma, 1 case; (g) fibroma, 1 case.

¹Journal of the American Medical Association, June 7, 1902.

[169] The symptoms of the condition depend entirely upon the degree to which compensatory circulation has been established. Obliteration of any one of the three great veins of the body may exist for many years with even good health and a completely effected collateral circulation. There seem to be two groups of cases, one in which the patient has had for years complete compensation and good health and the symptoms set in acutely. This was well illustrated in a case at the Montreal General Hospital, reported by Wilkins (Case 6), in which I made the dissection. The patient was a robust, hale man, aged 34, who twelve months before, while lifting, felt something give way. He had occasional attacks of dyspnœa and a smothering feeling. His urgent dyspnœa came on somewhat suddenly, and for three months he had a great deal of
[170] oppression of breathing, due in large part to recurring effusion into both pleural sacs. There was complete fibroid obliteration of the superior vena cava.

In the second group the symptoms of obstruction of the venous circulation are constantly present, though varying in intensity, as in the case here reported, and the condition may be consistent with a fair measure of health.

CASE I.—Clinical Summary: Hard work, alcohol and exposure; dyspnœa, swelling of the neck and face; gradual distension of the superficial thoracic and epigastric veins; improvement for a time; gradual increase in the size of the superficial veins; on third admission tubercle bacilli were found; final admission with fever and delirium and unconsciousness; lumbar puncture, tubercle bacilli in exudate; tuberculous caries of spine; fibrous mediastinitis with obliteration of the superior vena cava and innominate veins; tuberculous meningitis.

Charles Diggs, colored, butcher.

First admission was on Dec. 7, 1898. The patient was at this time 22 years old. He complained of tightness across the chest, dyspnœa and swelling of the neck.

The family history was unimportant.

Personal History.—Patient had had no rheumatism, typhoid fever, malaria or pneumonia. He had not been sub-

ject to headache, nor had he any sensory disturbance. Ven- [170]
ereal history; gonorrhœa six times. Patient says he has had
a chancre, but from the description the sore was probably
chancroid, and there have been no secondary symptoms. To-
bacco: patient began smoking at eight years of age, and
smokes several packages of cigarettes a day. Alcohol: gin,
whiskey and beer have been used abundantly, fifteen glasses of
beer at least a day. He has often been drunk. He is a
heavy eater. He is often exposed to the weather, and has a
great deal of heavy work.

The present illness began six days before admission. The
patient went to bed feeling well, and woke up with dyspnœa.
He noticed that his neck was swollen, and felt as if some-
thing were pressing against his chest tightly. The pain in
his chest was not definitely localized. He noticed that his
face was flushed. The patient had not been drinking on the
night of the first symptoms, but had been drunk the previous
night. The condition had grown worse each day. He had
been treated before admission with doses of nitroglycerin,
1-100 of a grain, and had been given irrigations for his
urethritis. The appetite was good and his bowels were regu-
lar. He thinks he has lost ten pounds since the onset of the
symptoms.

Present condition.—The patient is a strong, well-nourished
mulatto. The face and eyelids are puffy. The tongue is
coated with a yellowish fur. No anæmia of the mucous
membranes. The neck is full; the vessels are dilated and dis-
tended with blood. Slight general pulsation of the neck. No
tracheal tugging. The chest is well formed; respiratory
movements equal. There is distinct tenderness on pressure
in the epi-sternal notch. The right clavicle is more promi-
nent than the left.

The lungs are clear throughout on auscultation and per-
cussion. There is no dulness below the sternum suggestive
of mediastinal growth. Superficial veins on the thorax and
of the upper right arm and shoulder are dilated.

Heart not enlarged; sounds quite clear. Pulse 78 to the
minute, of fair volume and tension. The right radial is
slightly fuller than the left; the vessels are palpable.

[1170] Glands: The inguinal, the left epitrochlear, the posterior cervical and the submaxillary are enlarged. There is no œdema of the legs. The reflexes are apparently normal. The differential count shows a practically normal ratio of leucocytes. The X-ray picture was negative and nothing abnormal could be seen with the fluoroscope.

Two weeks after admission a slight pleuro-pericardial friction rub was noted. On December 21 the patient was discharged, distinctly improved. The veins of the neck were less distended than on admission. During the first three days he had had a slight temperature, but since that time had been practically free from fever.

The patient was admitted a second time on December 1, 1899, complaining of pain in the chest and of swelling of the face. Since leaving the hospital he had been unable to do any hard work. Every exertion would cause swelling of the face and neck. He had been "drinking and sporting" until two months before the present admission, and during these two months there had been a steady pain in his chest, sometimes extending into the arms. He had slept poorly. On examination the superficial veins were found dilated in the forearms as well, and the thoracic subcutaneous veins were found to anastomose with the superficial and deep epigastrics. The current in these thoracic veins was distinctly from above downwards. The radial pulses were equal. No thrill and no diastolic shock were observed during his stay in the hospital. The patient was discharged improved on January 2, 1900, again with a diagnosis of probably intra-thoracic tumor.

On several occasions during the spring of 1900 the patient was demonstrated to the students at the out-patient clinic. The absence of all signs of aneurism and of enlargement of the glands, the negative character of the X-ray picture, the slow course of the disease, led to the diagnosis of fibroid obliteration of the superior vena cava.

He was admitted for the third time on June 20, 1900, complaining of pain in the chest and in the right arm and of a cough. While away from the hospital he had been comfortable so long as he took care of himself. The cough had lasted three weeks and had been accompanied by much expectora-

tion. The right radial pulse was now distinctly fuller than [170] the left. The veins were more dilated on the right side of the thorax. The right lung was distinctly impaired. Tubercle bacilli were found on June 23. The expectoration was muco-purulent in character and very foul. There was a great deal of insomnia due to the cough. The patient insisted upon leaving the hospital on June 25. Fig. 1 shows the distension [171] of the superficial veins.

The fourth and last admission was on February 16, 1901, when the patient came in complaining of cough which had lasted three weeks. He had been spitting blood at intervals for a year and had night sweats. His appetite was poor, and he had had a good deal of vomiting. He had also had constipation. Two days after admission tubercle bacilli were again found, and the condition of the right lung was worse than on the previous admission. His cough was racking and very severe. On February 31 he became noisy and profane and refused to keep on his clothes, and during the afternoon was found lying on the floor, and irregular convulsive movements of the extremities were noted, and the patient was apparently unconscious. The temperature rose to 102.6°. On being put to bed the patient kept making peculiar grimaces, but soon became rational and did not remember the period of unconsciousness. His speech was distinctly thick like that of a drunken man. On February 24 the patient became restless; there was marked cyanosis of the face and extraordinary injection of the conjunctivæ; there was definite nystagmus; the pupils were unequal, the left being larger; there was frothing at the mouth. The dilatation of the veins had become appreciably greater. Later in the day the cyanosis increased. Bleeding was resorted to and temporarily quieted the patient. The respirations were very stertorous throughout the day. Soon after midnight, after a violent convulsive attack, the patient became quieter and died at 1.50 a. m. on February 25.

Lumbar puncture was done at the time of death and the fluid showed leucocytes and tubercle bacilli.

Autopsy by Dr. MacCallum on February 25, 1901, nine hours after death.

Anatomical Diagnosis.—Chronic tuberculosis; tuberculous

[171] caries of spine; fibrous tissue growth in the adjacent regions, with involvement and occlusion of vena cava superior and of innominate veins; establishment of extensive collateral venous circulation; tuberculous meningitis.

The body of a young negro, 170 cm. long. Over the anterior thoracic and abdominal regions, reaching down to the inguinal regions, there are many tortuous and distended subcutaneous veins. To facilitate the dissection of the venous system hot water and then colored wax were injected into the femorals. The dissection reveals the following condition of the venous system: The right jugular and the right subclavian, much dilated, formed the right innominate, which is immediately obliterated to form a dense thick cord. The right internal mammary is obliterated at its junction with this innominate. The left internal jugular is obliterated, or partly so, in the neck. It joins the left subclavian to form again a fibrous mass which represents the innominate on the left side. The two innominates unite to form a fibrous mass which represents the superior vena cava (Fig. 2). Within the pericardium, however, this vessel is patent from the point where it receives the wide azygos vein to the heart, but it is not more than 15 mm. wide and its walls are quite thick. The azygos vein is 1 cm. in diameter, and there is no obstruction at its mouth. The anterior perforating branches of the internal mammary are very wide and connect with the long tortuous subcutaneous veins. The superficial brachial veins communicate similarly with these tortuous veins, forming a pre-pectoral anastomosis (Fig. 3). The tortuous veins communicate with the superficial and probably with the deep pectoral veins in the inguinal region. The sinuses in the cranial cavity are dilated and contain non-adherent thrombi. The left jugular vein being occluded, blood from the head must have passed out mainly by way of the right jugular, through the right subclavian, through the pre-pectoral anastomosis with the anterior perforating branches of the internal mammary and with the subcutaneous tortuous veins to the superficial epigastrics and thence to the inferior vena cava, which was normal throughout its course. An alternate course would have been from the subclavian to the upper right intercostal veins through the

perforating branches of the latter and thence to the azygos, [171] which was very large (12 cm. in diameter). On the left the blood from the subclavian vein followed a similar course. The obliterated portions of the innominate and jugular veins lie as a firm mass of fibrous tissue firmly adherent to the spinal column. Peritoneum and pericardium normal.

Lungs: Both adherent to the pleura at the apices; bronchial glands enlarged; considerable œdema present. Many tubercles at each apex and throughout the lung. A cavity 2 cm. in diameter present in the right lung. Between the tubercles the intervening lung is scarred, but there is no pneumonia. Both lungs are adherent to the vertebral column at their upper portions.

Spleen: Substance is pale and flabby.

Liver: Near the edge there is a puckered white opaque thickening of the capsule.

Stomach, pancreas, kidneys, testes normal.

Vertebræ: Removal of the fibroid mass surrounding the innominate veins reveals an erosion of the centra of the last cervical and the first two or three thoracic ventebræ, with complete denudation of the bone. There is a focus of disease in the last cervical and first thoracic vertebral centra. These have collapsed and caused a slight skoliosis and possibly some kyphosis. The cavity thus formed extends into the spinal canal but causes no special compression of the cord. The adjacent centra are much eburnated. The fibrous tissue lying upon this cavity in the ventebræ is continuous with that about the innominate veins. There is no marked abnormality in the cranial vessels. The pia, especially in the fissure of Sylvius about the cerebellum, the base of the brain and the medulla, shows many miliary tubercles. The lateral ventricles are slightly distended with fluid. The ependyma shows a fine granulation.

CASE II.—*Hodgkin's Disease; Compression of Superior Vena Cava; Extensive Collateral Circulation; Formation of Phleboliths; Unusual Chronic Course; Autopsy.*

M. H., aged 31, varnisher, applied at the Medical Dispen- [172] sary, October 4, 1889, complaining of swelling of the neck

[172] and of the face. Family history is good. None of his relatives have had any glandular enlargements.

He himself has always been well and strong, with the exception of the usual diseases of childhood.

About 1884 he first noticed swelling of the glands of the neck, chiefly on the right side. It did not increase much, but shortly afterwards he noticed the glands on the left side were a little large. They, however, did not interfere with his work. Throughout the year 1887 there was a decided increase in the glandular enlargement, and about Christmas of that year the face was a good deal swollen and the veins of the face and of the arms and front of chest began to swell. He also

[173] had shortness of breath on slight exertion. Through last year and the present year this condition has persisted. The glandular enlargement has been progressive; the swelling of the veins very marked, and on exercise he gets extremely livid.

On October 4, 1889, I dictated the following note: The patient is a small, spare man; the face is greatly suffused and swollen, the conjunctiva moist and injected, and about the lips and cheeks there is slight lividity. The tongue also is somewhat cyanosed. The venules are prominent and the veins of the cheeks and forehead are distinct. There is great enlargement of the glands of the neck, particularly on the right side. They are firm and hard, extending on both sides of the sterno-mastoid muscles and reaching to the clavicles, the outlines of which are obliterated by the swelling. The axillary glands are not enlarged. When stripped the most striking feature is the enormous distension of the thoracic and abdominal veins. The manubrium looks prominent and the first and second interspaces near the sternum look full. Beneath the skin of the sternum and over the whole front of the thorax large veins can be seen, and on palpation there is felt a soft plexus of distended vessels. Palpation causes great pain over the manubrium and the first and second left interspaces.

On percussion there is absolute flatness on the manubrium, extending into the infra-clavicular space and as low as the nipple, where it is continuous with that of the heart. The dulness extends only about two inches from the sternal margin. The apex beat is neither visible nor palpable. Percus-

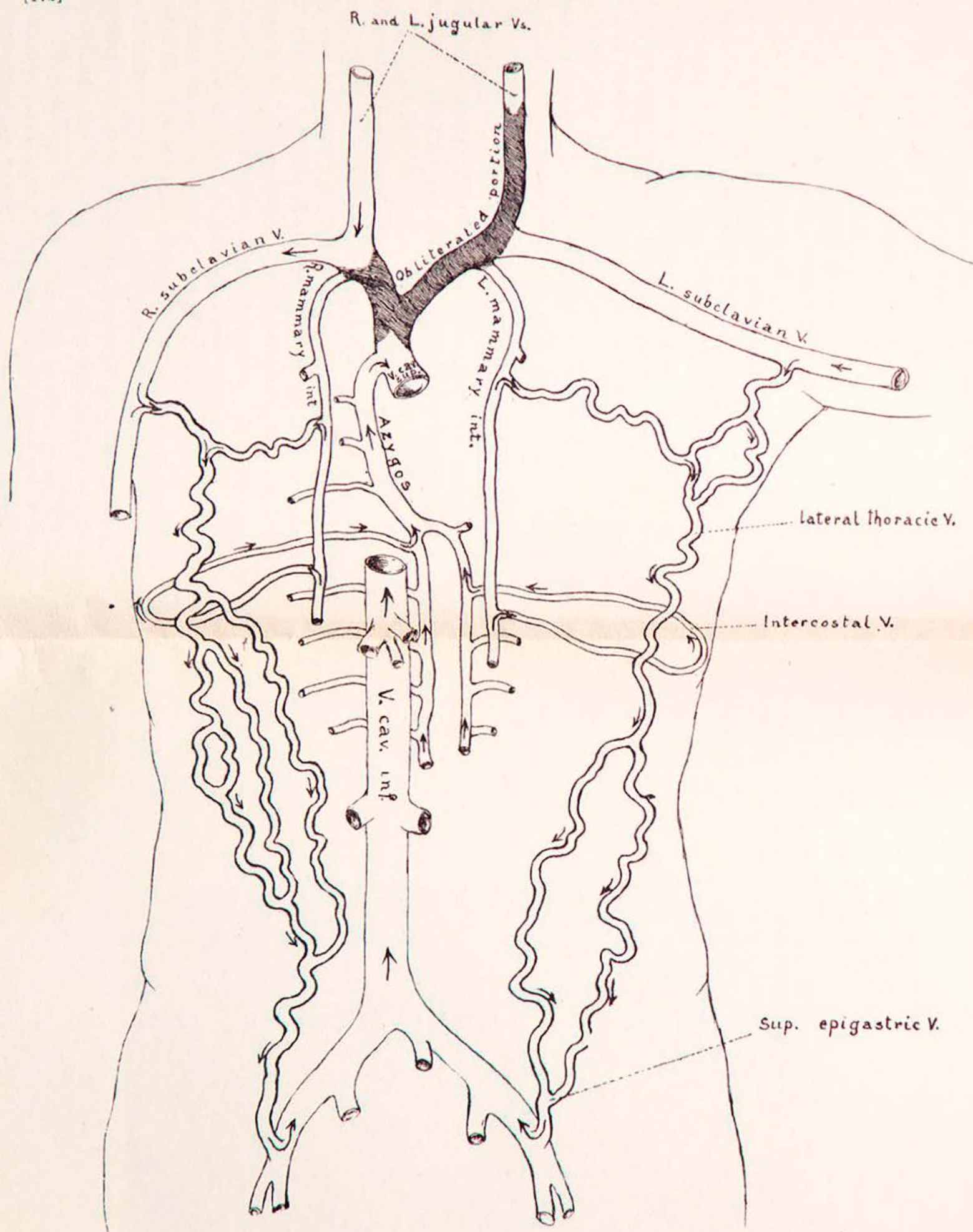


FIG. 3.

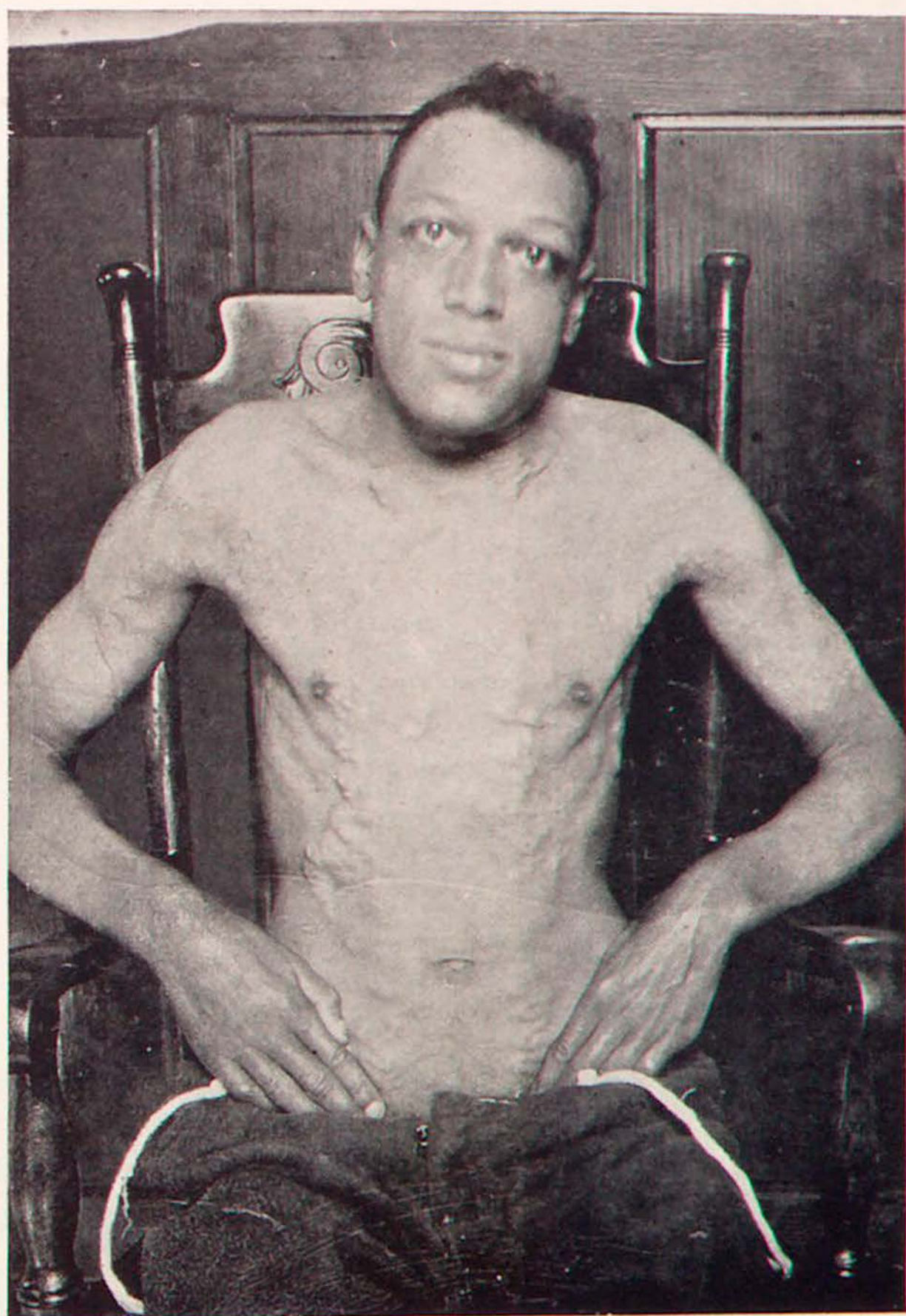


FIG. 1.

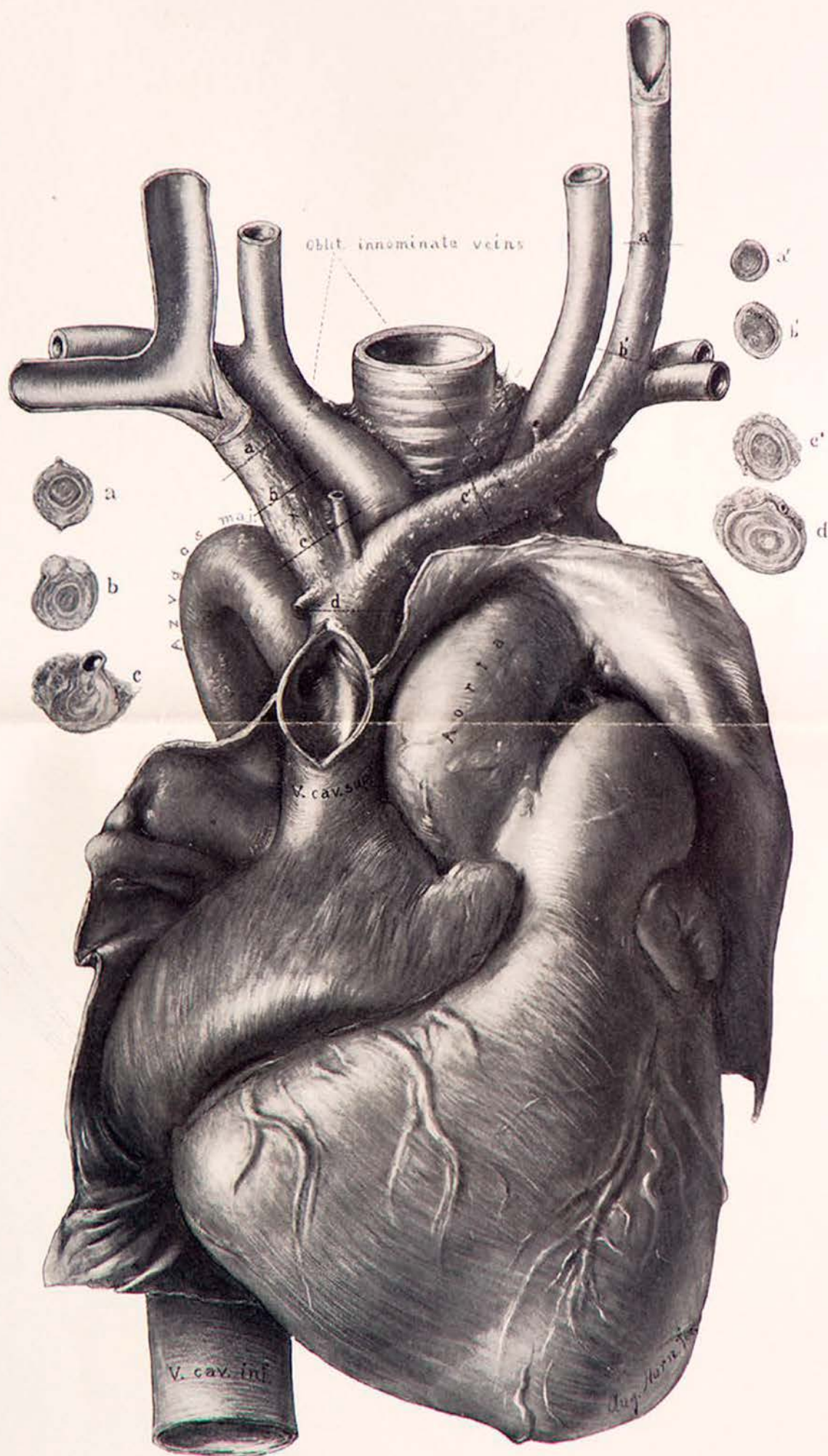


FIG. 2.

sion is clear on the right side in front and on both sides behind. [173]

On auscultation, the heart sounds are clear, the aortic second accentuated; no murmur in aortic region or at apex. Respiration is very feeble and distant in left infra-clavicular and mammary regions. The radials are equal. There is no lividity of the hands; no enlargement of the veins; no clubbing of the fingers.

The abdomen looked full and beneath the skin there could be seen the superficial epigastric veins enormously distended; the right one almost as large as the index finger. The blood current in them is from above downwards.

The patient was placed upon Fowler's solution, minims v, to be increased. From this time until his death, 1893, that is for fully three years and a half, this patient was under our observation, and I showed him repeatedly at the clinics, and once at the Hospital Medical Society.

I will note here some of the special features in his case as dictated by me at different periods.

December 7, 1889, venous engorgement not so marked. He has had two smothering attacks at night and has had blood spitting.

January 18, 1890, he was better, the glandular enlargement was not so marked, eyes not so suffused. He has been taking Fowler's solution of arsenic up to 15 minims three times a day and has had a little diarrhoea. The swelling of the glands has distinctly lessened. He has a good appetite.

February 25, 1890, the note is: Feels very well; has improved wonderfully; scarcely any more swelling on the right side than on the left; the glands of the lower part of the neck are still enlarged, and only slightly tender. Difference in the pulses still apparent.

March 24: Glandular enlargement even smaller than before; less tender. He has had a distressing papular eruption on the face, hands and neck, which itches very much. Throughout the summer he improved a great deal and felt very much stronger.

On September 4 I dictated the following note: There is a red papular rash which itches. The swelling on the right side

[173] of the neck is still painful to the touch. Though the swelling in the neck has diminished, the cervical glands are still enlarged; the distension of veins over the front of the chest is now enormous, extending on either side to the nipple line; the epigastric veins are also enormously enlarged and plexiform. In some of the larger veins over the manubrium thrombi are to be felt. The large cutaneous veins extend over the right shoulder and biceps. The face is still suffused, but not nearly so much as before. The dulness persists over the manubrium and the left infra-clavicular space. Heart sounds are clear; there is no murmur; no venous hum. There is very marked difference between the breath sounds in the left and right infra-clavicular regions; in the former they are scarcely audible.

Throughout the year 1891 he was frequently under observation and there was very little change. I examined the heart repeatedly. There was never any venous hum, never any murmur. He took the Fowler's solution at intervals; towards the end of the year he had some pain in the left arm and the left side of the chest.

On April 5, 1892, I made the following note: General condition remains unchanged, though the glands of the right side of the neck are now not very much swollen. They are well marked on the left side. The sternum is perhaps more prominent, but it is difficult to say whether this is due to increase in the bone itself or to the enormous veins in the subcutaneous tissue. The skin is not abraded or reddened. The plexuses of veins already referred to is very marked. Just under the left nipple one of the larger veins contains a thrombus and higher up towards the manubrium there are several phleboliths the size of peas. The right epigastric vein is still larger. There is a slight heaving of the whole chest with each cardiac impulse. The heart sounds are clear, aortic second not accentuated. No venous hum over the plexus. Face a little suffused; no change in the pulmonary condition.

In July the patient had a hemorrhage, stated to be from the lungs. In September he said that he had been fairly well all summer and had tried to do a little work. The face was
[174] congested and full; the glands on the right side of the neck

still considerably enlarged. The superficial epigastric veins [174] were distinctly smaller, but there seemed to be no change in the condition in those of the sternum. Early in January I showed the patient at the clinic. The condition was practically the same, though the epigastric veins were certainly not quite so large.

The patient died in March, 1893, and an autopsy was obtained by Dr. Flexner, but under most unfavorable circumstances, and the thoracic organs had to be hurriedly examined, so that no complete dissection could be made in situ. The superior cava was completely obliterated by the enlarged mediastinal glands.

SUMMARY OF CASES.

(Cases from the literature of fibroid obliteration of the superior vena cava, collected by Dr. E. H. Hume.)

A. THROMBOSIS DUE TO DISEASE WITHIN VEIN.

I. (a) *Phlebitis*.

1. Breschet: *Traité des maladies des artères, &c.*, Paris 1819 (translation of Hodgson's *Diseases of Arteries*), No. 150; Preparation in Museum of Faculty of Medicine, Paris; a wax model made under direction of Dupuytren. Thrombosis of vena cava superior.

2. Wolff: *Mag. f. d. ges. Heilk.*, Berlin, 1823, XIV, 570. Female, 19; sarcoma of shoulder. P. M., inflammation of right auricle and pericardium; thrombosis of vena cava superior.

3. Claverie, G. E.: *Thèse de Paris*, 4°, 1858. Male, 52, jeweler; onset of symptoms gradual, lasting thirty years; gout three years previously; death from gangrene of foot following gout. P. M., vena cava a fibrous cord; pericardium adherent; lungs, chronic phthisis.

4. Rees: *Lancet*, 1860, II, 585. Female, 48; œdema of upper and lower extremities. P. M., complete obliteration; thrombosis of vena cava superior, evidently phlebitis; disease evidently propagated from right auricle.

5. Rees: *Guy's Hospital Reports*, 1861, 3. s., VII, 113.

[174] Female, 54; heart disease. P. M., entrance to vena cava superior obliterated by phlebitic thrombi.

6. Wilkins: Lancet, 1883, I, 812. Male, 34, naval officer; strain twelve months previously. P. M., thrombosis with complete obliteration of vena cava superior.

7. Garcia Rijo: Crón. méd. quir. de la Habana, 1887, XIII, 412. Male, 38, soldier. P. M., complete obliteration of vena cava superior by thrombosis.

8. Hirschlaff: Inaug. Diss., Berlin, 1893. Female, 51; diphtheria at eighteen; rheumatism at twenty. P. M., mitral stenosis; aortic and mitral insufficiency; marantic thrombosis of vena cava superior, with complete obliteration.

(b) *Propagated Thrombus.*

9. Duchek: Prager Vierteljahrsschrift, 1854, XLI, 109. Pathological specimen in Museum at Vienna. No clinical history. Vena cava superior obliterated by thrombus propagated from periphery.

(c) *Tuberculous Endophlebitis.*

10. Banti: Sperimentale, Mem. Orig., Firenze, 1891, XLV, 408. Male, 46; carpenter; death from acute miliary tuberculosis. P. M., vena cava superior a hard cylinder; a vegetative mass occupying the auricular entrance to vena cava superior; microscopically, tuberculous endophlebitis.

B. THROMBOSIS DUE TO DISEASE WITHOUT THE VEIN.

I. *Tuberculosis.*

11. Tonnelé: Jour. Hebd. de Méd., 1829, V. Male, 2; cough, diarrhoea, vomiting. P. M., complete obliteration; encysted tuberculous mass, caseous at centre, connected vertebræ to vena cava superior and obliterated the latter; thrombosis of superior longitudinal sinus propagated to vena cava superior.

12. Reid, J.: Edinb. Med. & Surg. Jour., 1835, XLIII, 297. Female, 40, of irregular habits. P. M., vena cava superior a cartilaginous cord connected to right bronchus. Process probably originated in tuberculous bronchial glands.

13. Paulus: Oesterreich med. Woch., 1842, 2 quartal., [174] No. 14. Clinical history not given. P. M., secondary caries of right petrous bone; complete obliteration of vena cava superior by propagated thrombus.

14. Duchek: Loc. cit. Male, 52. P. M., vena cava superior obliterated and attached by fibrous tissue to right bronchus. The process evidently originated in a tuberculous gland.

II. Mediastinitis (unclassified).

15. Oulmont: Mem. Soc. Méd. d'obs., Paris, 1856, III, 391, 468. Female, 49, cook. P. M., a fibrous mass in mediastinum attaching bronchial gland to left bronchus and vena cava superior; vena cava superior completely thrombosed.

16. Habershon: Lancet, 1875, II, 837. Male, 37, coal-heaver. P. M., complete obliteration; chronic mediastinitis leading to fibrous transformation of vena cava superior; evidently congenital, certain valvular defects being present.

17. Williams: Proc. Path. Soc., Dublin, 1877, n. s. VIII, 8. Female, 27; rheumatism eight years before. P. M., vena cava superior a fibrous cord, probably due to inflammation around mediastinal glands.

18. Roberts: Lancet, 1893, II, 1386. No clinical history. P. M., complete obliteration; fibrous transformation of vena [175] cava superior, probably due to mediastinitis.

III. Aneurism.

19. Martin-Solon: Arch. de Méd., 1836, 2. s., X, 296, Female. P. M., enormous aneurism of aorta; vena cava superior obliterated in walls of sac.

20. Duchek: Loc. cit. Male, 39. P. M., vena cava superior obliterated and lost in the walls of an aneurismal sac.

21. Watson: Practice of Physic, Ed. Condie, 1866, 798. Male, 33. P. M., complete obliteration, vena cava superior being lost in walls of sac of an aneurism of aorta.

22. Russell: Medical Times and Gazette, 1871, II, 130. Male; injury to chest three years previously. P. M., complete obliteration; vena cava superior lost in walls of sac of huge aneurism of aorta.

23. Willigk: Prager Vierteljahrsschrift, 1853, XXXVIII, 20. Female, 44, laborer. P. M., complete obliteration; fibrous vena cava superior included in syphilitic scar tissue in right bronchus.

24. Duchek: Loc. cit. Female, 47. P. M., Vena cava superior obliterated and attached by fibrous scar tissue, evidently syphilitic, to right bronchus.

25. Fraenkel: Deutsche Med. Woch., 1891, XVII, 1378. Male, 45, history of syphilis and alcoholism. P. M., complete obliteration; compression of vena cava superior by mediastinal syphilitic granuloma; thrombosis of vena cava superior.

V. *Periaortitis.*

26. Rigler: Wien Med. Woch., 1858, VIII, 1. Male, 70; painter; rickets and typhoid; acute rheumatism often after 28. P. M., dilatation of aorta; periaortitis; thrombosis of vena cava superior.

27. Meigs: Transactions of the Coll. of Phys., Phila., 1886, 3. s., VIII, 13. Male, 72; general arterio-sclerosis; sudden vertigo on day of admission. P. M., complete obliteration; mediastinitis and periaortitis, leading to thrombosis of vena cava superior.

VI. *Carcinoma.*

28. Barth: Bull. soc. anat., Paris, 1853, XXVIII, 4. Female, 36, healthy, 5-para. P. M., cancer of lung and heart; vena cava superior obliterated by organized clot from the auricle upwards.

VII. *Fibroma.*

29. Pastau: Virch. Arch., 1865, XXXIV, 236. Female, 42. P. M., fibroma pressing on innominate artery and vena cava superior; complete thrombosis of vena cava superior, with calcification of walls.

C.D. West.

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*Chronic Cyanosis, with Polycythæmia and
Enlarged Spleen: A New
Clinical Entity.*

BY

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FROM
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CHRONIC CYANOSIS, WITH POLYCYTHÆMIA AND ENLARGED SPLEEN: A NEW CLINICAL ENTITY.

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THE group of cases here reported, with those collected from the literature, are worthy of careful study, as we have here in all probability "a definite clinical entity and one which is new to medical science," to use the words of Saundby and Russell in describing their case. The condition is characterized by chronic cyanosis, polycythæmia, and moderate enlargement of the spleen. The chief symptoms have been weakness, prostration, constipation, headache, and vertigo. A further analysis will be reserved until after the consideration of the cases:

CASE I. *Cyanosis for years, of unknown origin; albuminuria; rapid pulse; polycythæmia; high vascular tension.*—Dr. K., aged forty-four years, consulted me October 28, 1901, complaining of a rapid pulse and diffuse cyanosis. He has been a very healthy man, active and vigorous, of good habits; has had no serious illnesses. He has been uneasy about himself, as he had detected a trace of albumin in the urine. For several years his wife has noticed that he has had a very congested appearance, and the eyes would often be deeply suffused. I have seen him at intervals for the past five years and have known him to be a very blue-faced man. He has been of a constipated habit. His eyes are somewhat prominent, but his wife says this is natural to him. He has constantly a feeling of fulness in the head, sometimes a sensation of vertigo, and for these symptoms he consulted me.

He was a well-built, well-nourished man; the face much suffused; the ears looked a little blue; the conjunctivæ were injected, and the lips distinctly cyanotic. The tongue also looked cyanotic. The general surface of the skin looked suffused and the anæmia left after pressure of the hand on the skin was very marked and very slowly obliterated. The feet and hands were quite cyanosed. The radials and temporals were moderately sclerotic. Pulse 120, regular. Apex beat in fifth, just inside the nipple line; sounds clear; aortic second a little accentuated. There was no enlargement of the thyroid. No enlargement of the liver; moderate enlargement of the spleen, the edge of which was palpable. The chest was well formed, not barrel-shaped; the cervical muscles not prominent. Expansion of the chest good. No sign of emphysema. Expiration not prolonged. Once or

twice he called on cold days to show the extreme cyanosis, and twice he came in with cough, which troubled him chiefly at night.

Several careful analyses of the urine were made by Dr. Futcher. The specific gravity ranged from 1012 to 1017; albumin was constantly present, as a rule only a trace; no sugar. On centrifugalizing there were a few hyaline and finely granular casts.

I was very much puzzled as to the nature of this case, and thought that he had some chronic degeneration of the kidneys, with slight arterio-sclerosis, but I did not think it could be advanced, as there was no marked hypertrophy of the heart, and the aortic second was not specially ringing. I could not account for the cyanosis.

Blood. The examinations were made by Dr. Futcher. Drop from ear almost black in color; flows sluggishly. A striking feature is the slowness with which the drop spreads under the cover. With the usual-sized drop the field is found almost filled with red cells; they look natural. Another striking feature is the relative scarcity of leucocytes. Red blood corpuscles, 9,952,000; leucocytes, 4000; hæmoglobin, 120 per cent. (Fleischl). No measurements of the red cells were made. Several counts were made, as it was thought that there might have been a mistake.

Two observations of the blood pressure, taken on the right arm when he had been in the sitting posture for about ten minutes, gave maximum pressure, 203 mm. Hg.; minimum pressure, 175 mm. Hg. Five minutes later the maximum pressure, 200 mm. Hg.; minimum pressure, 172 mm. Hg.

I saw this patient repeatedly during 1902. There was very little change in the condition. The cyanosis was always marked. He was able to attend to his practice. There was no shortness of breath; the heart's action became slower. I once counted it at 72, but he said that it was often at 120 per minute. The last examination of the urine, November 14th, showed only a trace of albumin and a few hyaline casts. The spleen never became much enlarged, but it was always easily palpable. He went to California and has since been under the observation of Dr. McBride.

CASE II. Recurring attacks of nausea and vomiting; remarkable cyanosis, of some years' duration; pain in side; polycythæmia; albuminuria.—M. C. (General Hospital Nos. 31202, 34970, 38753, 40820, 42041), aged thirty-five years, a Russian Jew; tailor by occupation; admitted for the first time on July 11, 1900, complaining of constipation.

The family history was unimportant.

Personal History. The patient has always been well. Since coming to this country, six years ago, he has been pressing in a tailor-shop, and has had to work standing. He denies gonorrhœa and syphilis. He uses alcohol moderately. Ever since coming to the United States the patient has been troubled with constipation, the bowels never moving more frequently than every second day. This is worse in the summer. Three years ago, during the summer, the bowels on one occasion were constipated for fourteen days. There is no pain during these attacks. For a long time he has been dark in color; he does not know for how long, but his friends have noticed it.

The patient's bowels moved eight days before admission after taking licorice powder. He had been constipated for four days previous to

that. Seven days ago the patient began to vomit after each meal. He has vomited daily since. Castor oil, Epsom salts, and licorice powder have been ineffectual. There have been no other symptoms save that of drowsiness. The patient has voided very little urine during these eight days.

On examination the patient was a well-nourished man, with marked cyanosis of the face, hands, and mucous membrane; the tongue was heavily coated.

The physical examination proved entirely negative, except for the cyanosis already noted. The temperature reached 102° shortly after admission, and fell to normal by midnight and remained so. On this day the blood count was: red blood corpuscles, 7,172,000; leucocytes, 21,800; hæmoglobin, 120 per cent.; no malarial parasites found; Widal reaction negative.

On July 16th the blood count was: red blood corpuscles, 6,520,000; leucocytes, 14,400; hæmoglobin, 102 per cent. The patient is feeling very much better and the bowels are moving regularly.

The patient was admitted for the second time on May 27, 1901, complaining of vomiting, which came on five days before admission. The patient admitted excessive indulgence in soda-water on the day of the illness. He states that he has vomited "every moment" since the onset, and that there has been some blood in the vomitus, which is very foul-smelling. The bowels have been constipated since the onset. He has eaten nothing for several days. There is no abdominal pain.

May 29th. Dr. Fitcher noted that the cyanosis was still very marked, especially in the buccal mucosa, and that there was a marked pyorrhœa alveolaris. Slight tenderness in the right iliac fossa. The spleen and liver were not enlarged.

27th. The blood count gave red blood corpuscles, 8,900,000; leucocytes, 23,000; hæmoglobin, 125 per cent.

28th. Vomiting continues unabated. Calomel, cerium oxalate, and lavage have been ineffectual in stopping it. Analysis of the vomitus: total acidity, 85; free HCl, 37; no lactic acid.

29th. Red blood corpuscles, 10,200,000; hæmoglobin, 112 per cent.

30th. Lips very livid; the general surface of the skin, including face, trunk, and extremities suffused. The imprint of the hand disappears very slowly, and the nails are a little cyanosed.

June 1st. Patient's bowels were finally moved by a high enema. The blood count was as follows: Red blood corpuscles, 7,576,000; leucocytes, 30,000; hæmoglobin, 115 per cent.; specific gravity (chloroform and benzol method), 1068.

4th. The patient was discharged feeling greatly improved, the bowels having commenced to move somewhat more freely.

The patient was admitted for the third time on April 29, 1902, complaining of an attack of vomiting, hiccoughing, and constipation, which began seven weeks previously. He had vomited bile several times. The attacks of vomiting have lasted for ten or twelve days at a time and recurred repeatedly. The blood count on admission was as follows: Red blood corpuscles, 7,144,000; leucocytes, 8,600; hæmoglobin, 110 per cent.

On April 30th Dr. McCrea noted that the area of stomach tympany

was slightly increased; cyanosis still present; considerable pigmentation of the skin. Differential count of the leucocytes: Polymorphonuclear, 79.4 per cent.; small mononuclear, 14 per cent.; large mononuclear, 2.4 per cent.; eosinophiles, 1.8 per cent.; transitionals, 2 per cent. A test-meal showed free HCl present; no lactic acid. On two successive days after a long fast the stomach-contents were removed and revealed a fair amount of free HCl. The blood count on May 12th was little changed.

On May 22d the patient was discharged improved, the bowels moving regularly.

The urine had a specific gravity of 1010 to 1020, with a trace of albumin and a few casts, usually hyaline, but on one admission granular.

The fourth admission was on November 7, 1902, the patient stating that he was awakened at 4 A.M., three days before admission, with a pain in the left side, followed by vomiting, which has been continuous since. No blood in the vomitus. Constipation for five days. The patient has not eaten anything since the onset and has taken very little water. There has been some hiccoughing. Blood count: Red blood corpuscles, 7,316,000; leucocytes, 12,300; hæmoglobin, 112 per cent. The cyanosis is still very marked. There is some dyspnœa, vomiting, and hiccoughing. A differential count of the leucocytes shows a slight increase in the polymorphonuclears and a diminution in the small mononuclears since the previous record. The specific gravity of the blood is 1083.

November 12th. Red blood corpuscles, 8,300,000.

15th. Red blood corpuscles, 6,700,000. Coagulation time, one and a half minutes. Specific gravity, 1072.

19th. The vomiting persisted until two days ago and the vomitus showed at all times free HCl; no lactic acid; slight starch digestion. The constipation was also very obstinate until yesterday. Discharged improved.

Patient admitted for the fifth time on January 28, 1903, and for the sixth time March 11th. On both of these occasions the chief symptoms were pain in the left side and the obstinate constipation. He says that the pain brings on the vomiting. The vomitus is at first frothy and white, later greenish in color. The pain is deep below the tenth and eleventh ribs on the left side, and extends toward the posterior axillary fold. On his last admission the cyanosis was extreme, the face was almost black, and the expression very anxious. There was no albumin in the urine, but on March 30th there were a few granular casts. The blood pressure was 125; the specific gravity of the blood 1081. The bowels were freely moved, and this always gives him relief. On the last admission there was very little vomiting, yet the cyanosis was never more marked.

May 25th. Patient has been keeping very well and is at work. He complains of pain in the left side, under the ribs, and says that as he walks he keeps his hand over the sore spot. The cyanosis is marked, quite as much as at any time in the hospital. The impression of the hand on the skin of the trunk remains a long time. The spleen is not palpable; the vertical flatness is about four inches in extent. He thinks that the skin has become darker.

CASE III. (Dr. Lowman.) *Chronic cyanosis; enlarged spleen; polycythæmia; headache; increased tension; albuminuria.*—While making a visit at the Lakeside Hospital, Cleveland, with Dr. Lowman, my attention was directed to a patient who was unusually cyanosed and who had an enlarged spleen. On further examination the case was found to belong to the group under consideration. I am indebted to Dr. Darby, Dr. Lowman's first assistant, for the notes of the case.

Female, aged forty-four years, married, of English descent, admitted to the ophthalmological division of the hospital for double pterygium, failing vision, and headache; for the latter she was transferred to the medical service. The condition of the fundi was negative, with the exception of tortuosity of the vessels.

The family history was negative.

She had had the usual infectious diseases. She had been a very healthy woman of good habits. There was no history of syphilis. She had not had winter cough or attacks of asthma. She has two children living and well. For many years, she does not know how long, she has been blue. She has had no cough, no special shortness of breath on exertion. For four years she has had headaches, which have become more intense during the past four months. They begin over the left eye and extend backward and down the neck.

On examination the patient is well nourished; the skin is dark in color, and there is a general cyanosis, particularly marked on the face, arms, and upper part of the trunk; the feet and toes are blue. Everywhere the impression made with the finger disappears slowly. The conjunctivæ are suffused. The eyes are not specially prominent. There is well-marked pterygium. Looking more closely at the face there are some distended venules about the nose and cheeks. The lips are quite cyanosed, and the tongue and buccal mucous membranes have a dusky blue color. The radials are moderately sclerotic; the vessels seem full and the tension high. The apex beat of the heart cannot be felt; there is no visible shock; no enlargement upward or to the right. The sounds are clear; the second pulmonic is accentuated. The chest is not barrel-shaped. Percussion note is clear everywhere, and there are no bronchitic râles; no prolongation of expiration.

The abdomen looks normal. On palpation the spleen is enlarged, extending 7.5 cm. below the costal margin; the anterior margin and the notch are easily felt. The upper limit of flatness is on the eighth rib. The liver is not enlarged.

Blood. April 13, 1903, red blood corpuscles, 11,616,000; leucocytes, 5100. Differential count: Polynuclears, 59 per cent.; lymphocytes, 32 per cent.; large mononuclears, 8 per cent.; eosinophiles, 0.5 per cent. Hæmoglobin, 120 per cent. Specific gravity, 1067. A subsequent examination made on May 8th gave the red blood corpuscles 10,692,000.

Urine. No excess of the daily amount; clear in color; specific gravity ranged from 1010 to 1016; reaction acid; a trace of albumin and a moderate number of hyaline and granular casts.

At my suggestion the patient was put upon sodium nitrite, and Dr. Darby writes, under date of May 8th, that the headaches have entirely disappeared.

CASE IV. (Dr. Stockton.) *Chronic cyanosis; general weakness; headache, and general pains, with attacks of weakness and shortness of breath; pigmentation of skin; death; autopsy.*—When speaking of the condition with Dr. Lyon, of Buffalo, he mentioned a remarkable case of chronic cyanosis in the Buffalo Hospital under the care of Dr. Stockton, and on his return he found that there was polycythæmia. To the former I am indebted for the following notes, and to the latter for permission to use them:

J. T., a Turkish Jew, aged forty-six years, married, a shoemaker, had been admitted to various Buffalo hospitals (General, Erie County, German, etc.) for several years on different occasions, and died in the German Hospital, Friday, May 1, 1903.

His chief complaint was general weakness, chronic headache; pain in the feet and legs, made worse by walking; general diffuse pains in the abdomen, pains also over the region of the heart, moderate chronic constipation, a slight cough, and occasional attacks of shortness of breath.

For about twenty years he has had a slight cough, off and on, worse in the winter and at night. Headache has troubled him for the same period (twenty years), and indefinite pain in the chest has been felt more or less during the past twenty years. His general strength had been of exceptional vigor until about six years ago, when it began to fail. About four years ago he began to grow much darker and bluer in his skin—cyanosed. Then he began also to have pains in different parts of his body, pain and a prickling sensation in the legs and feet, pain in the right chest and right shoulder; pain in the abdomen, not localized, but diffuse and general; headache continuing. The pain in different parts of the body was not constant, but shifted from time to time.

However, the headache and the pain in the legs and abdomen were present with tolerable constancy and have continued so up to his death. The pain was described as dull and aching. In addition to the pains, he had marked weakness during the last six years of life.

Constipation was never a marked feature of the case, though the bowels were generally sluggish. The appetite was poor and capricious. He had nausea occasionally, but never vomited.

During the past four years he had been going from hospital to hospital, spending a few months at a time in each, until he felt better, then returning to his home and trying to work, but soon being required to return to a hospital because of his weakness, headache, body pains, and sometimes shortness of breath. In the hospital he would remain in bed most of the time, or sit quietly in a chair, occasionally walking slowly around the ward or going to the dining-room for his meals.

Cyanosis. The most striking feature of the case during the past four years has been a high-grade, extreme, general cyanosis, making the patient an object of general interest and curiosity in the various hospitals where he sojourned. His entire skin was dusky and bluish and his mucous membranes livid, resembling the appearance of a "blue baby" with congenital heart disease; in fact, he was jocularly called the "blue baby." This cyanosis was constant, though at times after rest in bed it improved somewhat, and again at other times was much intensified.

Pigmentation. The skin was generally dark and showed fine punctiform mottling or pigmentation, suggesting capillary extravasation as a cause, though no definite history of subcutaneous hemorrhages could be obtained. The naturally pigmented parts of the body were much more deeply pigmented than normal. The mucous membranes showed no appreciable areas of pigmentation.

Dyspnœa. During the last three years of life he had occasional attacks of increased weakness, cyanosis, and dyspnœa, his body becoming cold, so that his wife had often thought him dying. In the hospital, however, dyspnœa was seldom marked, though the respirations were generally moderately increased.

Physical Examination. A short, stocky, well-built, and well-muscled man. Cyanosis as already noted. Pigmentation as already noted.

Heart. The heart sounds were always clear and without murmur at any time, but were generally rather weak, except the second pulmonic sound, which was somewhat accentuated. The heart's area by deep percussion was slightly enlarged to the left and right. In the sixth interspace, about one and a half inches to the left of the nipple line, could be seen an area of pulsation, the chest wall dimpling inward with each systole—*i. e.*, systolic retraction. This sign required a careful inspection to be seen.

Vessels. The arteries were soft and compressible. The veins were everywhere full and visible. There was slight throbbing of the vessels of the neck, above the clavicles, thought to be arterial.

Thorax. The lungs were everywhere hyperresonant on percussion, and the area of resonance extended downward at the bases behind somewhat, and in front on the right side the area of liver dulness did not begin until the seventh space was reached in the parasternal line. The area of resonance above the clavicles was not appreciably increased. On auscultation the breath sounds were soft and expiration was not prolonged. Occasional wheezes and sibilant râles could be heard over both lungs on different occasions during the last few months of life. (Dr. Thayer, who saw this case with Dr. Lyon, tells me that the state of the chest did not suggest to him emphysema.)

Liver. Flatness began in seventh space in parasternal line and extended vertically downward to about two inches below costal margin, where the edge could be felt.

Spleen. Never palpable, and its area on percussion was less than normal (perhaps explained by the emphysema of the lungs).

Abdomen normal.

Glands normal.

Legs. Occasionally very trifling œdema was observed over the ankles, more distinct on the left side. No œdema elsewhere was ever observed.

Eye Examination, February, 1903. Both disks hyperæmic. Retina surrounding disks thickened. Vessels, particularly veins, engorged and tortuous.

Urine. An occasional trace of albumin; otherwise negative.

X-ray Examination of Thorax. Nothing abnormal except slightly enlarged heart.

Blood. The blood from the ear or finger-tip was on many occasions during the last few months of life examined and found extremely dark in color, and so thick that it would adhere to one side of thin filter

paper without penetrating it. The depth of color and darkness of the blood was far beyond the range of estimation for hæmoglobin by the color scales of the various hæmoglobinometers. The red corpuscles were never counted until the day of death, when they were counted at 8,250,000. Differential leucocyte count normal. Leucocytes were generally about 8300, never showing a hyperleucocytosis.

Pulse. The pulse was generally about normal, occasionally after exertion rising temporarily as high as 120 to the minute.

Temperature always normal.

Respirations. The general respiratory rate was from 22 to 25 per minute, once reaching 50 after severe exertion, with symptoms of collapse. On the afternoon of death the respirations were 38 per minute.

Death occurred on May 1, 1903, at 7 P.M., at the German Hospital in Buffalo, after three days' residence in the hospital. The patient died, without any special symptoms or discoverable complications, in collapse and after a few hours of drowsiness deepening into semiconsciousness.

The full report of the autopsy is not yet available, but Dr. Lyon writes that the heart was about normal; the lungs showed moderate emphysema, with cyanosis and œdema; the spleen was moderately enlarged. Nothing definite was found to account for the condition.

Cases from the Literature.

CASE V. (Vaquez, *Bulletin Médical*, Paris, 1892, vi., 849.)—Male, aged forty years. For ten years extremities cyanosed; veins distended. Then palpitations, dyspepsia, bronchial catarrh. Three years ago vertigo (Ménière type); buzzing and whistling in ears; staggering and eddying of objects; vomiting; no unconsciousness. Gums swollen, bleeding on irritation.

On examination, chronic cyanosis; no œdema. Heart: No definite auscultatory phenomenon. Blood: Red blood corpuscles, 8,900,000; leucocytes, normal.

Second admission: Paroxysmal vertigo. Attack of pain in lumbar region, ended by discharge of red blood corpuscles in urine, lasting four to six days. Liver enlarged, 20 cm. in right mammary line. Spleen 24 cm. in extent. Urine, three litres daily; same amount of fluid as ingested. Blood: Finger, 8,450,000; elbow, 8,200,000, once 9,130,000; specific gravity, 1080; hæmoglobin, 165 per cent.; hyperalkalinity of blood.

Pathology. Probable hyperactivity of hæmatopoietic organs, for of two cases of congenital cyanosis, one, with red blood corpuscles, 7,000,000, had a large spleen; the other, with 4,500,000, had no palpable spleen.

CASE VI. (Cabot, *Boston Medical and Surgical Journal*, December 7, 1899.)—Female, aged forty-six years, widow, masseuse. Six years before admission she had sudden loss of consciousness, with settling of blood on one side of face and thick speech, which lasted several days. Four years later, after a period of hard work, she began to have periods of collapse, mental and muscular; face became purple, eyes injected; she was once thought to be drunk; vasomotor phenomena often present. Sciatica two weeks before admission; ecchymoses on thigh.

On examination, cyanosis of the face and tongue. Heart: No murmurs. Urine: Trace of albumin; a few hyaline casts. Blood: Red blood corpuscles, 10,460,000; leucocytes, 20,000; hæmoglobin, 150 per cent. Heart apparently normal; pulse 90. No note on the spleen.

Course. Rested well in summer, but still cyanotic. Thyroid treatment had no effect. Later on, after tooth extraction, bleeding lasted half a day; made her better. Soon afterward she had attacks in which her legs began to move spontaneously, the feet moving around each other. A second attack on the train in two weeks. Soon weakness of left arm and leg, headache, vomiting. She died comatose.

Autopsy. Hemorrhage, middle meningeal; passive congestion of all the viscera.

CASE VII. (Cabot, *Boston Medical and Surgical Journal*, March 15, 1900.)—Female, aged forty-nine years, spinster. Complaint, vertigo, weakness, bad taste, constipation. Blue line noted. Given potassium iodide and cascara.

One year later, trace of albumin and hyaline casts in the urine. Lead detected in the blood. Blood: Hæmoglobin, 120 per cent.

Father died of "consumption of blood."

Otitis media at eighteen years; several attacks of rheumatism. Menopause at forty-six years. Since then vertigo, palpitation, and headache; dizzy most of time. No tinnitus or nausea or eye symptoms. Cyanosis of lips for six months. Constipation. Four months ago three teeth drawn; then stomatitis set in. Itching at night. Polyuria.

On examination, cyanosis of face and mouth, hands and feet. Heart: Slight systolic murmur at pulmonary area. Spleen enlarged up and down. Hæmoglobin, 120 per cent. In one week vertigo and cyanosis diminished. Hæmoglobin, however, remained at 120 per cent. Four years later, red blood corpuscles, 12,000,000; spongy, bleeding gums; vertigo and staggering; skin bronzed. Lost twenty pounds in six years. Spleen a hand's breadth below ribs. Red blood corpuscles, 9,252,000; leucocytes, 10,600; hæmoglobin, 110 per cent. After venesection, red blood corpuscles, 10,032,000; normoblasts, 5. Later spleen reached to navel; red blood corpuscles, 11,352,000. Examination of gastric contents: No free HCl.

CASE VIII. (McKeen, *Boston Medical and Surgical Journal*, 1901, cxliv., 610.)—Male, aged fifty-three years, German, packer in iron foundry.

Family history unimportant.

Personal History. Dyspnœa twenty years ago, eight days; recurred at intervals of six months to two years. Alcohol, beer, and whiskey used moderately.

Present Illness. One and a half years ago cyanosis of face and hands following an attack of dyspnœa. The cyanosis has persisted since, with exacerbations. Works right along; exertion causes no dyspnœa or cyanosis. Every second or third day blurring of vision, sweating, vertigo, staggering; no headache or tinnitus. When blue the hands are cold and numb. For two years frequent attacks of diarrhœa, sometimes with prolapsus recti.

On examination, no dyspnœa; respirations 18 to the minute. Cyanosis of face, hands, and feet. Fingers clubbed. Erythema on

shoulders and chest. Eyes congested. Tongue cyanotic. Gums swollen and bleeding. Many of the teeth loose. Arteries slightly thick. Heart, no murmurs. Lungs hyperresonant. Spleen one inch below rib, descending to two and a half inches on deep inspiration. X-ray showed emphysema. Urine: A trace of albumin, granular casts, red blood corpuscles, and leucocytes. Blood: Red blood corpuscles, 9,380,000 to 9,840,000; leucocytes, 9000; hæmoglobin, 120 per cent.

CASE IX. (Saundby and Russell, *Lancet*, 1902, i., 515.)—Male, aged forty-three years, an electroplater. First visit on April 13, 1891, complaining of pains in body, especially abdomen; headache for three or four months. Spleen enlarged. Urine: Specific gravity, 1010; a trace of albumin; no casts.

Second visit on January 29, 1898, complaining of cyanosis.

Family History. Mother died of phthisis.

Personal History. Syphilis at nineteen years, gastric fever at twenty-four years, later jaundice.

Present Illness. Eight months ago pains, gnawing, in abdomen, worse in morning; no vomiting; constipation. For six weeks loss of flesh and weakness.

On examination, dull, speech thick, memory and attention poor. Cyanosis of face. Fingers clubbed. Teeth bad. Bronzing of legs. Spleen extends to middle line and navel; hard, slightly tender. Heart: No murmurs. Red blood corpuscles, 9,000,000; hæmoglobin, 120 per cent. Once a few hyaline casts. He grew drowsy, jaundiced, and cyanotic. Later, red blood corpuscles, 7,360,000.

Autopsy. Hypertrophy of left ventricle. Spleen, 1440 grammes; consistency normal. Brain congested. Suprarenal small, dark, soft. Thymus not noted.

Weil (*La Semaine Médicale*, June 29, 1901) has a brief note on two cases of hyperglobulism, with cyanosis, lasting from birth, in two children, one aged two years, the other four years. The blood count is not given. In one the spleen was enlarged, in the other normal. No heart disease.

Analysis of the Cases.

Six of the patients were males and three females. All were in the middle period of life, the youngest thirty-five years and the oldest fifty-three years. There was nothing in the occupation or in the station of life of any moment. The features may be considered in detail.

CYANOSIS. Naturally this attracts most attention and has been the feature which has led to further investigation. As is usual in all forms of cyanosis, it is most marked about the face and hands, but in Dr. Lowman's case and in both of my patients the skin of the entire body was of a dusky blue. When first seen the suffusion of the conjunctivæ and the prominence of the eyes, as in Case I., may add to the startling appearance of the patient. The cyanosis is more intense in cold weather, and is aggravated by any existing bronchial catarrh. On bright, clear days, with but little moisture in the air, it may lessen

greatly, as in Case I. The period over which the cyanosis has been noticed varies from ten years (Case V.) to three or four years (Case I.). While constant, as a rule, it may vary greatly in intensity. In Case II. the patient usually came in very deeply cyanosed, the condition aggravated, no doubt, by the vomiting and the loss of liquids, but after a few days, when the bowels were moved, the color became less intense; but I saw this patient only the other day, some six weeks after his last attack of nausea and vomiting, and he was intensely cyanosed. There is no respiratory distress with the cyanosis. While the skin looks full and tense and the face and hands bloated, yet marked dilatation of the larger superficial veins is not noted. On close examination of the skin, many fine, dilated venules are seen.

BLOOD. The viscosity is greatly increased. All observers have remarked not only upon the unusually dark, but upon the thick and sticky character of the blood drop. An extraordinary polycythæmia is a special feature of the affection. The maximum blood count was 12,000,000 per c.mm. in Cabot's second case. In eight of the cases the count was above 9,000,000 per c.mm., and in the ninth (Case IV.) it was 8,250,000 per c.mm. There have been no measurements of the red blood corpuscles. The statement is made that in the polycythæmia of congenital heart disease the red blood corpuscles are smaller than in that of high altitudes. The percentage of hæmoglobin has been high, ranging to (in Case V.) 165. Usually the range has been from 120 to 150. In Case IV. it is stated to have been above the scale. The specific gravity of the blood in Case V. was 1080, and in Case II. it ranged from 1067 to 1083. In eight of the cases the leucocyte count ranged from 4000 in Case I. to 20,000 in Case VI. As a rule, in a majority of the cases it has been below 10,000 per c.mm. In Case II. on one admission the count reached 30,000 per c.mm.

SPLEEN. In seven of the nine cases the spleen was enlarged. In four of these the enlargement may be termed great, reaching nearly to the navel. In Case VI. there was no note. In Case II. it was not enlarged.

The liver was enlarged in Case V.

URINE. In seven of the cases a trace of albumin was noticed, with hyaline, sometimes granular, casts. In Cases V. and VII. there was no note on the urine. The specific gravity was usually low.

PIGMENTATION OF THE SKIN. As might be expected from the prolonged existence of the cyanosis, the skin was noted to be pigmented in several of the cases (II., III., IV., VII., IX.).

SYMPTOMS. The symptoms have been very varied. Most of the patients have complained of headache, weakness, and prostration. Headache was a prominent symptom in four cases, vertigo in four, constipation in four, pains in back and abdomen in three cases.

Attacks of nausea and vomiting were a special feature in Case II., and are mentioned as present in Case V. Cough and shortness of breath were each present in one case. Fever was not noticed in any of the cases. The pulse was noticed to be of high tension and the vessels sclerotic. There was no œdema of the skin. The torpor, mental and physical; the sensation of fulness in the head, with headache, vertigo, and in some cases nausea and vomiting, remind us of the symptoms to which mountain climbers and aeronauts are subject. Three of the cases were fatal. In Case IV. the patient died in collapse after a few hours of drowsiness. In Case VI. the patient died comatose, with cerebral hemorrhage. In Case IX. the patient became drowsy and died in coma. The autopsy in Case IV. showed the heart to be about normal, moderate emphysema of the lungs, with cyanosis and œdema and moderately enlarged spleen. In Case VI. there was passive congestion of all the viscera and hemorrhage from the middle meningeal artery. In Case IX. there was hypertrophy of the left ventricle, with congestion of the brain.

REMARKS. *Chronic cyanosis*, a common enough feature in clinical work, is met with :

1. In organic disease of the heart, particularly in congenital malformation, in chronic myocardial and tricuspid lesions in children and adults, and in cases of adherent pericardium.

2. In certain diseases of the lungs, particularly emphysema, and in long-standing pulmonary tuberculosis of the fibroid type. Practically there are only two conditions in which patients walk into the hospital or into our consulting-rooms with extreme cyanosis, congenital heart disease, and emphysema.

3. In the methæmoglobinæmia of chronic poisoning with coal-tar products, as antipyrin and acetanilid, etc. In this condition, too, the patient may startle one by the markedly cyanotic appearance.¹

There are a good many people whose normal condition is one of great fulness of the bloodvessels of the skin, so that in cold weather there may be marked cyanosis of the ears and of the face. We all know the stout, hearty, full-blooded man with rubicund face—the type which has been well described by Clifford Allbutt in his *Lane Lectures*—a common one among draymen and in men of that class, who live much in the open air and who drink freely. In them cyanosis, though not necessarily present, may be very marked in the face and hands when the temperature is low. As a rule, the peripheral circulation is

¹ I am sorry I have not got a blood count in a case of this sort. As a rule, there is anæmia; in a remarkable case which I saw with Dr. T. R. Brown, the hæmoglobin was only 50 per cent. Unfortunately no count was made of the red blood corpuscles. In the case of a physician with extreme cyanosis from long-continued use of antipyrin, a blood count was made, and I remember that the red corpuscles were not above normal, but I have not the actual figures.

active and the normal condition is a vivid hyperæmia of the skin associated with dilatation of numerous small venules.

Cyanosis, local or general, indicates one fact—diminished oxygenation of the blood corpuscles. In the deepest cyanosis of the ear or of the finger-tip the blood count may not be above 5,000,000 per c.mm. Only recently Dr. Fitcher examined for me the blood of a red-faced, short-breathed Englishman, whose skin seemed fairly bursting with blood and whose fingers and ears were quite cyanosed. The red blood corpuscles were only just above 5,000,000 per c.mm. In the local cyanosis of Raynaud's disease the blood count may be very little above the normal. I have a patient at present in the wards in whom the blood count from the cyanosed foot ranges from 4,500,000 to 6,500,000; the count from the ears about 5,500,000 (Dr. Briggs). A few weeks ago, in Dr. Brayton Ball's wards of the New York Hospital, I saw an interesting case of coma (which turned out to be due to a fracture of the skull) with the most intense localized cyanosis in the fingers of one hand, active, vivid red hyperæmia of the fingers of the other hand, and normal-looking blood distribution in the ears. The count, very kindly made for me by Dr. N. B. Foster, was practically normal and the same in all three situations. Contrariwise, the anomaly may be present (though I must say it is rare) of a red face and general superficial hyperæmia with a very low blood count. During this session there has been under my care in Ward E a patient with what we have termed *anæmia rubra*. With a blood count of about 2,000,000 per c.mm. from ear-tip or finger-tip, he was as red as a beet, and it was not until his blood had fallen to nearly 1,200,000 that he began to present a typical picture of pernicious anæmia. On admission, with his blood at a little above 2,000,000, and looking the healthiest patient in the ward, he had nucleated red blood corpuscles. In the cyanosis of emphysema and the ordinary forms of heart disease, the number of red blood corpuscles per cubic millimetre is not, as a rule, much increased, and rarely reaches the limit of polycythæmia, which, as suggested by Cabot, may well be placed at 7,000,000. Occasionally most extraordinary cyanosis occurs in adherent pericardium, as in a case reported by me (*Archives of Pediatrics*, 1896) and in the case reported by Lorrain Smith and McKisack (*Transactions Pathological Society*, London, 1902). In the latter the blood count was 6,000,000.

Polycythæmia. There are two classes of polyglobulism—*relative*, in which the condition is due to a diminution in the quantity of the plasma of the blood, and *true*, in which there is an actual increase in the number of blood corpuscles. Much work has been done of late years on the subject. Relative polycythæmia is very common. It may be caused by a deficient amount of fluids ingested, which possibly may be the cause of polycythæmia of the newborn; more frequently

it is caused by loss of liquids, either by (a) sweat; (b) diarrhœa (by far the most common); (c) increased diuresis. (d) In another group of cases there is loss of liquids by secretion or transudation, as in narrowing of the pylorus with dilatation of the stomach, and in the constant loss of liquids from the blood in recurring ascites. It is interesting to note that in some of these cases the polycythæmia is of a high grade and may persist for months or even for years. It is not necessarily associated with cyanosis, as in cases of dilated stomach and in diarrhœa. There is also a toxic polycythæmia described in poisoning by phosphorus and carbon monoxide, which, too, is probably relative. The polycythæmia of vasomotor disturbances, such as has been determined by Becker, Thayer, and others after the cold bath and after violent exercise, also comes in this class. Where the much-discussed polycythæmia of high altitudes should be placed is by no means certain. While a number of observers hold that there is new-formation, the lack of oxygen acting as a stimulus, others believe that it is relative, and due to increased elimination of fluids from the body, or that it is entirely due to a large number of corpuscles in the peripheral circulation. Others, again, think it is entirely due to the effects of decreased atmospheric pressure. The microcytes, poikilocytes, and nucleated red blood corpuscles point to new-formation, but the question is still under discussion.

True Polycythæmia. Vaquez and his pupil, Quiserne (*Thèse*, Paris, 1902), limit to this class the condition in which with an increased formation there is a continued increase in the number of red blood corpuscles in the circulating blood. It is met with where there is difficulty in proper aëration of the blood, as in high altitudes, or in heart disease, congenital and otherwise; and also in the obscure cases of the form here under consideration. The polyglobulism is regarded as a mode of adaptation to the new conditions and a sort of functional reaction of the organism. Belonging to this group is the polycythæmia so readily studied in congenital heart disease, and described by Krehl, Gibson, and others. The figures often reach as high as 8,000,000 or 9,000,000, rarely so high as in the form discussed in this paper.

It is by no means easy to offer a satisfactory explanation of the polycythæmia with cyanosis here under consideration. It does not seem possible to connect it in any way with the moderate grade of enlargement of the spleen, and yet there are one or two observations in the literature which are of great interest in this connection. Rendu and Widai (*Bull. et mém. Soc. méd. des hôpitaux*, 1899, 3 s., xvi. 528) report the case of a policeman who had an attack of vomiting without apparent cause, with dyspnœa. The temperature was normal. Red blood corpuscles, 6,200,000; leucocytes, 6000. This count gradually

diminished. On examination, skin subicteric; cyanosis of face and hands marked, to a less degree all over the body. A tumor, evidently the spleen, reaching from diaphragm to iliac crest. Eventually ulcers developed on tongue and the liver became enlarged. Autopsy: Spleen adherent to diaphragm, fibrous on section, and filled with caseous masses.

Moutard-Martin and Lefas (*Société des hôpitaux*, 1899) have also reported a case of a woman, aged forty-nine years, with pain in the left hypochondriac region, emaciation, no ascites, no cyanosis, with enlarged spleen, slight albuminuria. The red blood corpuscles were 8,200,000, the leucocytes 31,428. At the autopsy the spleen weighed 750 grammes and contained large caseating nodules.

With our imperfect knowledge of the physiology of polycythæmia it would be premature to discuss at any length the pathology of this remarkable group of cases. We need:

1. A careful study of all forms of chronic cyanosis with polycythæmia, particularly those associated with heart disease and emphysema. (It is to be noted that the cases here reported have the highest blood count on record, much higher than the average in congenital heart disease or in dwellers at great altitudes.)

2. A more accurate study of the blood in this class of cases—the volume, the viscosity, the state of the plasma and the serum, the amount of hæmoglobin, the specific gravity, and the diameter of the corpuscles. As increased viscosity of the blood, with resulting difficulty of flow, seems the most plausible explanation of cyanosis, it is especially important to test the viscosity by accurate physical methods and to determine the relation of the number of corpuscles to the viscosity of the blood.

3. The relation of the splenomegaly to the cyanosis and polyglobulism should be carefully observed. It may not be anything more than the effect of the chronic passive congestion.

Future investigation will determine whether we have here in reality a new disease. The clinical picture is certainly very distinctive; the symptoms, however, are somewhat indefinite, and the pathology quite obscure.

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THE HOME IN ITS RELATION TO THE
TUBERCULOSIS PROBLEM.

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BY

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FROM

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THE HOME IN ITS RELATION TO THE TUBERCULOSIS PROBLEM.

By WILLIAM OSLER, M.D.,

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[A lecture delivered under the auspices of the Phipps Institute, Philadelphia, December 3, 1903.]

I.

IN its most important aspects the problem of tuberculosis is a home problem. In an immense proportion of all cases the scene of the drama is the home; on its stage the acts are played, whether to the happy issue of a recovery, or to the dark ending of a tragedy, so commonplace as to have dulled our appreciation of its magnitude. In more than 400 homes of this country there are lamentations and woe to-night: husbands for their wives, wives for their husbands, parents for their children, children for their parents. A mere repetition of yesterday's calamities! and if the ears of your hearts are opened you can hear, as I speak, the beating of the wings of the angels of death hastening to the 400, appointed for to-morrow. That this appalling sacrifice of life is in large part unnecessary, that it can be diminished, that there is hope even for the poor consumptive—this represents a revulsion of feeling from an attitude of oriental fatalism which is a triumph of modern medicine. Our French brethren have made the present position of the question possible. Laennec, the father of modern clinical medicine, gave us the pathology of the disease—and much more. While Galen, Frascatorius, Morton and others believed strongly in the contagiousness of phthisis, it remained for Villemin to demonstrate its infectiveness by a series of brilliant experiments which made Koch's work inevitable; while to Verneuil, Chauveau, Nocard, Brouardel and others we owe the initiation of those local and international congresses which have done so much to rend the veil of familiarity, and to educate the public and the profession to a point at which scientific knowledge has become effective. It seems a law that all great truths have to pass through a definite evolution before they reach a stage of practical utility. First the pioneers, seeing as through a glass darkly groped blindly for the truth, but worked so effectually that by the seventh decade of the nineteenth century we had a clear pathology of tuberculosis and an accurate symptomatology; while in each generation a man had not been wanting, who, like Sydenham, or George Bodington, appreciated the essentials of treatment, as we recognize them to-day. Then Villemin and Koch demonstrated the truth of the infectivity of the disease and the presence of a specific germ. Watchers on the towers, like the late Austin Flint, a lifelong student of the disease, welcomed the announcement as the much-wished-for fulfilment of a prophecy; but, as Plato

shrewdly remarks, we are not all awake when the dawn appears, and many in this audience, like myself, had to see the truth grow to acceptance with the generation in which it was announced. It is a horrible thought, but very true, that we reach a stage in life, some earlier, some later, in which a new truth, a perfectly obvious truth, cannot be accepted; and the work of Villemin and of Koch fared no whit better with the seniles and the pre-seniles of the seventh and eighth decades of the last century than did Harvey's immortal discovery in his day, or for the matter of that, did Lister's great work. And now we are in the third or final stage, in which the truth is becoming an effective weapon in the hands of the profession and of the public. The present crusade against tuberculosis, which is destined to achieve results we little dream of, has three specific objects; first, educational—the instruction of the profession and the instruction of the people; second, preventive—the promotion of measures which will check the progress of the disease in the community; third, curative—the study of methods by which the progress of the disease in individuals may be arrested or healed. The three are of equal importance, and the first and the second closely related and interdependent. The educational aspects of the problem are fundamental. Nothing can be done without the intelligent cooperation of the general practitioners and of the community, and it is a wise action on the part of the Phipps Institute to take up actively this part of the work, and to spread a sound knowledge by lecture courses and by publications. It is not too much to say that could we get on the part of the doctors throughout the country an early recognition of the cases, with a practical conviction of the necessity of certain urgent and obvious measures, and on the part of the public attention to hygienic laws of the most elementary sort—could we in this way get the truth we know into the stage of practical efficiency, the problem would be in sight of solution.

Of late years there have been done in this country three pieces of work relating to tuberculosis of the first rank—that of Trudeau in the Adirondacks, enforcing on our minds the importance of the sanitarium treatment of early cases; that of Biggs and his associates in the New York Board of Health in demonstrating how much can be done by an efficient organization; and, thirdly, the work of Lawrence F. Flick, the Director of the Phipps Institute, in demonstrating by a long and laborious research the dangers of the house

in the propagation of the disease. In casting about for a subject it seemed to me most appropriate to discuss those aspects of the problem which concern the home in its relations to the disease, since after all the battlefield of tuberculosis is not in the hospitals or in the sanatoria, but in the homes, where practically the disease is born and bred.

II.

The germ of tuberculosis is ubiquitous; few reach maturity without infection; none reach old age without a focus somewhere. This is no new opinion. Gideon Harvey, in his *Morbus Anglicus* (1672, 2d Ed.), says: "It's a great chance we find, to arrive to one's grave in this English climate, without a smack of a consumption, Death's direct door to most hard students, divines, physicians, philosophers, deep lovers, zealots in religion," which is the English equivalent of the German popular saying, "Jedermann hat am Ende ein bischen Tuberculose." This may seem an exaggerated statement, but the records of Naegeli demonstrate its truth. After all, it is only from the post-mortem table that we can get a true statement of the frequency of tuberculosis in the community. It has long been known that a very considerable percentage of persons not dying from consumption have the lesions of tuberculosis. The records have ranged in different series from 7.5 per cent. (Osler), to 38.8 per cent. (Harris). But these studies were not made directly with a view of determining the presence of tuberculosis. They were the ordinary, everyday observations of the post-mortem room. The only series which we have dealing with this question in a satisfactory way is the study of 500 post mortems in Prof. Ribbert's Institute in Zurich, by Naegeli. It is to be borne in mind that in his work special examination was made of every organ of the body, sections were made of all parts with the greatest care, and the individual lymph glands particularly inspected. Tuberculous lesions were found in 97 per cent. of the bodies of adults.* He gives a very interesting curve showing the incidence at different ages. Up to the fifteenth year there was only 50 per cent., then there was a sudden rise in the eighteenth year to 96 per cent., with a slow rise, so that by the fortieth year a tuberculous focus was found in everybody. This careful research demonstrates the extraordinary susceptibility in man to tuberculous infection, and an equally extraordinary degree of resistance. In the tuberculin experiments of Franz on healthy Austrian soldiers a reaction was shown in over 60 per cent., so that we must accept the conclusion that tuberculous infection, latent tuberculosis, is much more extensive than is the manifest disease.

One interesting point is that we are never left long in peaceful possession of a satisfactory belief about the modes of infection in tuberculosis. No sooner had the pool got quiet and we had set-

tled into a comfortable conviction of the unity of human and bovine tuberculosis, than Koch stepped in and troubled the waters with his views on their dual nature; and now, just as the commotion was subsiding, von Behring stirs the waters by referring all tuberculosis to the milk-jug. But none of these investigations have diminished the importance of the home as the chief source of infection, the place in which the conditions favoring contamination are most common, particularly among the poor. Nor do I think that we can give up the view of aerial convection and of primary inhalation infection in a large proportion of the cases. Figures are, of course, tricky playthings, but it does seem that the overwhelming evidence of the prevalence of bronchial and pulmonary tuberculosis in children is in favor of the older views. After all, how rare is intestinal tuberculosis as a primary lesion, and if, as von Behring supposes, there is a special vulnerability of the bowels in childhood, we should expect a much larger number of cases. It is quite possible, as he has shown, and as Ravenel has demonstrated, that the bronchial and cervical lymph glands may be the first attacked in an animal infected through the intestines; yet the incidence in childhood of respiratory disease is so large, and the incidence of intestinal lesions is so small, that it counts strongly against von Behring's new views. In fact, primary intestinal tuberculosis is extraordinarily rare. Koch states that there have only been ten cases in ten years at the Charité Hospital, Berlin, and of 3,104 instances of tuberculosis in children there were, according to Biedert, only 16 cases, while in adults primary intestinal tuberculosis occurred in but one instance in 1,000 autopsies at the Munich Pathological Institute. In this country the studies of Bovaird in New York and of Hand in Philadelphia speak strongly in favor of air-borne infection in the large majority of cases in children. There is a special liability of the milk to become contaminated by the dust in uncleanly streets and in dirty houses, and upon this mode of infection von Behring lays great stress, and in infancy, either in this way or from the milk of tuberculous cows, he thinks the majority of persons become infected. Apparently he does not adopt Baumgarten's view of the latency of the germ itself, but of the latency of small foci of disease acquired in childhood, which only develop into active tuberculosis under favorable circumstances. It may be well to quote his own words in this connection, as his views are of importance: "I am well acquainted with the statistical arguments based on the higher returns of infection and mortality from consumption amongst attendants on the sick residents in houses occupied by people known to be phthisical, and inmates of prisons, which are intended to demonstrate the origin of pulmonary phthisis from the inhalation of particles of dust, or moisture containing tubercle bacilli. But in view of the extensive dissemination of tuberculosis above described amongst the human race, there is ample justifi-

* Virchow's Archiv, 1900, Bd. CLX, page 426.

cation for the objection that in cases of this kind, where persons succumb to pulmonary phthisis, tuberculous foci pre-exist in their lungs, and that these pulmonary lesions already present developed into active consumption, owing to the adoption by those persons of a mode of life favoring tuberculosis." (*British Medical Journal*, Translation Oct. 17, 1903.)

We need a systematic inspection, according to Naegeli's method, of the bodies of children dead of acute diseases, so as to get, if possible, the true incidence of infection in them. Councilman and others have shown how frequently tuberculosis is present in the bodies of young children dead of diphtheria, but the statistics at our disposal certainly do not bear out this view of von Behring, which would lead us to suppose that infection was largely a matter of childhood. Naegeli's figures on this point are interesting, though he only had 88 autopsies on children. Still his results are of value, as the inspections were made with such very special care. Of these 88 children there were only 15 with tuberculous lesions. In 10 of these the tuberculosis ran a fatal course; in 4 there were advanced lesions which did not cause death, and in only 1 was there a definitely healed lesion.

Sown broadcast as they are in our modern life, it is evident that few people reach maturity without harboring the seeds of tuberculosis. That we do not all die of the disease is owing to the resistance of the tissues, in other words, to an unfavorable, *i.e.*, the rocky soil on which the seeds have fallen. The parable of the sower sets forth in an admirable way the story of the disease. Since I used it in 1892, the illustration has become hackneyed, but in a semi-popular lecture I may be permitted to employ it again. The seed that falls by the wayside are the bacilli that reach our great highways, the air passages and intestines, in which they are picked up by the phagocytes, representing the birds of the air, or they are trodden under foot by the swarms of contending organisms. The seed that falls on stony places is that which reaches the lymph-nodes of the bronchi and mesentery, and though it springs up and flourishes for a while, there is no depth of earth, and, lacking moisture, it withers away into cretaceous healing. And that which falls among thorns represents the bacilli which effect a lodgment in the lungs, the kidneys or elsewhere, where they thrive and grow and produce extensive changes, but the thorns—the equivalent of the cares of this world and the deceitfulness of riches, in the parable—grow up also, and in the form of delimiting inflammatory processes and of contracting fibrosis, choke the seed, and recovery ultimately takes place. But falling on good ground, the seed springs up, increases and brings forth fruit some thirty, some sixty and some a hundredfold, which may be taken to represent the cases of chronic, subacute and acute tuberculosis. We are beginning to appreciate that the care of the soil is quite as important as the care of the seed. We cannot re-

peat Trudeau's remarkable environment experiment in our cities, but we learn a practical lesson of the influence of fresh air, open spaces and sunlight upon infected individuals. Much has already been done in this direction, and the reduction of the mortality from tuberculosis which has been going on for the past twenty-five years has been in great part due to improved sanitation. We have only made a beginning, but to know the enemy in this case, to know that his strength lies in the homes of the poor, is more than half the battle.

Let us look at the conditions confronting us in one of the large eastern cities. Like Philadelphia, Baltimore is fortunate in the absence of big tenement houses, but, like it, too, it has the disadvantage of a large number of very narrow streets and alleys. There is no drainage system, the sewerage is collected into cesspools, while the surface water and the water from the kitchens runs off on surface drains. There is a very large foreign population and a large number of colored people. While tuberculosis is a very common disease, I do not think the mortality in Baltimore is specially high. In the report of the Board of Health for the year 1901, there were 1,274 deaths from the disease in a total mortality of 10,479, about 12 per cent.

Four years ago two ladies, interested in the disease, gave me a sum of money to use in connection with our work at the Johns Hopkins Hospital. We do not take many cases of tuberculosis into the wards. Last year there were only 53. They come chiefly for the purpose of diagnosis, and we often admit patients from outside the city on purpose to teach them for a period of a week or ten days, just how to regulate their lives. It seemed best to try to do something for our consumptive out-patients, of whom we have an average of about 200 new cases in the year. It seemed to me that a good and useful work could be done by the personal visits of an intelligent woman to the houses of these patients, that she might show them exactly how to carry out the directions of the physician and give them instructions as to the care of the sputum, the preparation of food, and when necessary to report to the Charity Organization as to the need of special diet, or to the Health Board when the surroundings were specially unsanitary. In connection with this an inspection has been made of the condition under which these people live. Of the 726 cases, 545 were whites, and 181 blacks. Among the whites were 53 Russian Jews. There were 492 males, 234 females. The analysis of the reports of Miss Dutcher, Miss Blauvelt and Miss Rosencrantz during the past four years is briefly as follows:

	Russian	Colored	White
Bad sanitary location.....	62%	53%	16%
Insufficient light and ventilation.....	71%	65%	39%
Overcrowding.....	61%	41%	32%
Personal and household uncleanness.....	70%	56%	30%

The white population in a large majority of the cases was distributed irregularly throughout the city, but a large proportion live in good loca-

tions, many even on new streets in the suburbs. A small percentage, about 20, live in a bad neighborhood, where the houses are close together and hemmed in in narrow alleys and courts. This region lies chiefly to the south and west of the hospital toward the harbor. In about a third of these people the personal and household cleanliness is fairly good. The colored people make up about a fourth of the cases. They live in much more unfavorable localities, chiefly in narrow, thickly populated and dirty alleys in small, two-story houses, usually old, and the windows often limited to the front—houses in which proper lighting and ventilation are impossible. One important feature in the colored population is the desire always to occupy their own houses, so that there is a comparatively little overcrowding. The Russian Jews form about one-fourteenth of the total number of patients. They live in a neighborhood that was at one time inhabited by the wealthier classes and the houses have now been converted into tenements. The streets are in many cases wide and clean and sunny. The percentage of overcrowding in the rooms is high. Very often a family of seven or eight is found in two rooms. The contrast in the matter of personal and household cleanliness between the Russians and the other whites is most striking. It is exceptional to find the former in a condition, either in person or house, that could be termed in any way cleanly. A very serious thing is the frequency with which the patients move from one place to another. The 726 patients had during their illnesses occupied 935 houses. Last year the percentage of removals was still higher. The 183 patients had occupied 379 houses. Another important point brought out was the fact that fully 66 per cent. of the patients visited did not sleep alone.

Amid such sanitary surroundings the patient can scarcely avoid contaminating the house in which he lives, while, perhaps more important still, the environment, combined with insufficient food, etc., lowers the resistance of the other members of the family and renders them more liable to active disease.

How are we to combat these conditions? *First*, by an educational health campaign in the homes. The young women who have been engaged in this work in Baltimore have frequently reported to me the readiness with which their suggestions have been accepted, particularly in regard to the care of the sputum. To be successful such a campaign must be carried out by the Board of Health, and a staff of trained visitors, women preferably, should do the work. To carry this out effectually there should be, *secondly*, in all cities a compulsory notification of cases. The plan has worked most successfully in New York, and it should be everywhere followed. There are no difficulties which cannot be readily surmounted, and there need be no hardships. *Thirdly*, in most cities the powers of the Health Boards should be greatly enlarged, so as to deal efficiently with the question of proper disinfection of

the houses occupied by tuberculous patients. *Fourthly*, the question of the housing of the poor needs attention, particularly in the matter of proper control of tenements, and the regulation, by law, of the number of persons in each house. *Fifthly*, by placing upon the landlord the responsibility of providing, under the control of the Board of Health, a clean, wholesome house for a new tenant. *Sixthly*, the wholesale condemnation of unsanitary streets and blocks, and the rebuilding by the municipality, as has been done in Glasgow and elsewhere. We cannot make people cleanly or virtuous by act of the legislature, at the same time we cannot leave important sanitary details in the hands of irresponsible persons whose view of life is limited to returns and rentals. The extraordinary reduction in the mortality from consumption in the large cities is due directly to an improvement in environment. That much more remains to be done in the way of betterment the facts I have presented fully show.

III.

And then we have to face the all-important fact that at present an immense majority of all tuberculous patients have to be treated at home. Probably not 2 per cent. of the cases can take advantage of sanitarium or climatic treatment. What has the new knowledge to say to the 98 per cent., which is debarred from the enjoyment of these two great *adjutores vitæ*? Very much! Read aright, a message of hope to many. Just as we have learned that climate in itself is not the prime essential, but a method of life in any clime, so we have found that even under the most unfavorable surroundings many cases recover in town and country, if rigid system and routine are enforced. But "Hope, that comes to all," as the poet sings, comes not to the large proportion of the unhappy victims in our overgrown and crowded cities. What but feelings of despair can fill the mind in the contemplation of facts such as I have laid before you in the analysis of our inspection in Baltimore? So numerous are the patients that private beneficence shrinks at a task, which the city and State authorities have not yet mustered courage to attack, except in one or two places. Hospital care for advanced cases, sanitarium treatment for incipient cases can only be provided by an enormous expenditure, but we must not be discouraged, and the good work begun in Massachusetts, New York and in this State will grow and prosper. After all, the campaign in which we are engaged is one of education; only let us not forget that teaching has not all been on the side of the profession. We have all been at school during the past quarter of a century, and at school we must remain, at once teachers and pupils, if we are to make the knowledge we possess effective. We are not living in Utopia, and in the matter of sanitation the man on the street is a blundering, helpless creature whose lessons are put bodily into him at a heavy cost of life and health. You know this story only too well in Philadelphia. To provide accommo-

dation for all consumptives is impossible, but it is not unreasonable to look forward to the day when every large city will have a sanitarium for the treatment of the early cases, situated not far from its outskirts, with all the equipment for open-air treatment. Let there be some place at least where a poor workingman or working woman may have a chance for life. Now, as we doctors know only too well, hundreds are sacrificed in whom the disease could have been arrested. The hospital care of the very sick should be provided for in special wards of the city hospitals. To give the best of care to these unhappy victims is a true charity to them; to place them where they cease to be a danger to the general health is a true charity to others.

In the warfare against tuberculosis the man behind the gun is the general practitioner. The battle cannot be won unless he takes an active, aggressive, accurate part. That he is not always alert must be attributed in part to the carelessness which a routine life readily engenders, and partly to a failure to grasp the situation in individual cases. The two points to be impressed upon him are first, *that early recognition of the disease can only come from better methods of practice and greater attention to the art of diagnosis.* The insidiousness of the onset, the protean modes of advance, and the masked features of even serious cases should never be forgotten. As Garth so well puts it in his *Dispensary* (1699):

"Whilst meagre *Phthisis* gives a silent blow;
Her *stroaks* are sure; but her advances slow.
No loud alarms, nor fierce assaults are shown,
She starves the *fortress* first, then takes the *town*."

Too often precious time is wasted and the golden opportunity is lost by the failure of the physician to make a thorough examination of the chest. I am every day impressed with the necessity of more rigid, routine examination, even of the "ordinary case." In illustration of the carelessness which is so readily acquiesced in, let me mention a patient who was brought to me only a few weeks ago, supposed to have a protracted fever after typhoid. Her father, a physician, her husband a physician, and it is scarcely credible that neither of them had the faintest idea that the poor soul had advanced consumption, though it had reached a stage in which there was shrinkage of one side of the chest, and the diagnosis could almost be made by inspection alone. The carelessness is a sort of mental inadvertence, to which even the best of us at times seem liable. A very distinguished and careful physician brought his daughter to me a few years ago to have her blood examined, as he felt sure she had a chronic malaria. She had little or no cough, but an afternoon rise of temperature, and it turned out to be the usual story—quite pronounced local disease at her left apex. There had not been a suspicion on the part of her father or of the family.

On the other hand, we must be careful not to diagnose tuberculosis too readily. The physicians

of our sanatoria have a good many tales to tell in this matter.

The second point is the *necessity for a more masterful management of the early cases.* Here comes in that personal equation so important in practice, and which has such a vital bearing in the prognosis of the disease. The dead hand of the Arabian still presses sore upon our practice, and precious weeks are too often lost in trusting to a polypharmacy which in some instances would make the heart of Avicenna or Averroes to rejoice. It may seem hard to say so, but my firm conviction is that more tuberculous patients are injured than helped by drugs. We have not yet come to the belief—to the practical belief, at any rate—that the disease is not to be *treated* by them. After so much has been written and spoken, one would suppose that the essential features of the treatment of the disease were generally recognized, but the practical experience of any man who sees a great deal of tuberculosis is directly to the contrary. It is not so much that the drugs do harm *per se*, but that weeks of priceless value are lost in trying to check a cough and quiet a fever in a patient who is allowed to continue his work and is up and about. I cannot agree with a recent writer who says that the tendency at present is rather to make too little than too much of medicinal treatment. Perhaps in advanced cases we are more sparing, but in early stages *I know* that we are still leaning on the Egyptian reed in which our fathers trusted and trusted in vain. Year by year I see only too many instances in which the mental attitude of the physician toward the disease clearly indicates that the idea of an efficient home treatment by fresh air had never been entertained. What I would like to plead for most earnestly is this home treatment of early cases by modern methods. I am not addressing myself now to city physicians. But I would appeal to the practitioners in the country and in the smaller towns and in the suburbs, where the conditions are so much more favorable. I have been much interested for several years past in a group of cases scattered all over the country, usually in the farmer or mechanic class, in which I have supervised with the physician a home treatment, often with striking success. The remarkable case which I reported in 1900 gave me great encouragement, as the complete arrest of the disease was accomplished under the most primitive surroundings by the persistence and devotion of the patient herself, who richly deserves the good health she enjoys to-day. There have been disappointments; all cases are not suitable, all cases are not curable, and it is not easy to say which ones are likely to do well. The most favorable looking patient with a small patch at one apex may have a progressive disease and die in the best of surroundings, while a case with high fever, sweats and an extensive lesion may improve rapidly. On November 24, a fine, stalwart fellow came to see me, in whom I did not recognize the *poitrinaire*, of September 28, carrying his diagnosis in his

face. The sunshine and open air of a Maryland village had been enough; enough, at any rate, to put him on the high road.

Let me mention in a few words the essentials in this home treatment of consumption in the small towns, country places and the suburbs of our large cities. *First*, the confidence of the patient, since confidence breeds hope; *secondly*, a masterful management on the part of the doctor; *thirdly*, persistence—*benefit is usually a matter of months, complete arrest a matter of years, absolute cure a matter of many years*; *fourthly*, sunshine by day; fresh air night and day; *fifthly*, rest while there is fever; *sixthly*, breadstuffs and milk, meat and eggs.

Let us not forget that it was a country practitioner, George Bodington, of the little town of Sutton Coldfields, in Warwickshire, who, in 1840, revived the open air treatment of tuberculosis. "To live in and breathe freely the open air, without being deterred by the wind or weather, is one important and essential remedy in arresting its progress—one about which there appears to have generally prevailed a groundless alarm lest the consumptive should take cold." And he gives a number of cases showing the good effects of the open air treatment. He seems to have carried it out on the plan which was so strongly advocated by Sydenham, which was a combination of open air and riding or carriage exercise. There are few things more striking in the writings of Sydenham than the insistence with which he states that consumption is curable. It is worth quoting a paragraph which I take from Locke's *Anecdota Sydenhamiana*, as it is put in a more striking way than in his general work. "I am sure that if any physician had a remedy for the cure of a phthisis of equal force with this of riding he might easily get what wealth he pleased: In a word, I have put very many upon this exercise in order to the cure of consumptions, and I can truly say I have missed the cure of very few; in so much that I think how fatal soever this disease be above all others, and how common soever; (for almost two-thirds that die of chronical diseases die of a phthisis), yet it is this way more

certainly cured than most diseases of less moment: Provided always that this travelling be long persisted in according to the age of the patient, and length of the disease. . . . Women or very weak men that cannot ride on horseback may ride in a coach and yet attain the same end, as I have seen by often experience." In reality this practice of Sydenham never died out, but it was in practice in New England in the early days and throughout the eighteenth century. The late Henry I. Bowditch, who did so much to further the study of tuberculosis in this country, states that he followed it in his own case.

Let me conclude with a quotation from De Quincy, which puts in graphic language the question which so many generations have asked and asked in vain, but which we have been permitted to answer in part at any rate, and to answer in hope. "If you walk through a forest at certain seasons, you will see what is called a *blaze* of white paint upon certain *élite* of the trees marked out by the forester as ripe for the axe. Such a blaze, if the shadowy world could reveal its futurities, would be seen everywhere distributing its secret badges of cognizance amongst our youthful men and women. Of those that, in the expression of Pericles, constitute the vernal section of our population, what a multitudinous crowd would be seen to wear upon their foreheads the same sad ghastly blaze, or some equivalent symbol of dedication to an early grave. How appalling in its amount is this annual slaughter among those that should by birthright be specially the children of hope, and levied impartially from every rank of society! Is the income-tax or the poor-rate, faithful as each is to its regulating time-tables, paid by *any* class with as much punctuality as this premature *florilegium*, this gathering and rendering up of blighted blossoms by *all* classes? Then comes the startling question—that pierces the breaking hearts of so many thousand afflicted relatives: "Is there no remedy? Is there no palliation of the evil?" It is one of the greatest triumphs of scientific medicine to be able to reply, Yes, the evil may be palliated and is rapidly being lessened, and for many at least, a remedy has been found.

Unity, Peace, and Concord

A FAREWELL ADDRESS TO THE
MEDICAL PROFESSION OF THE UNITED STATES

BY

WILLIAM OSLER, M.D., F.R.S.

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UNITY, PEACE, AND CONCORD

ON this occasion I have had no difficulty in selecting a subject on which to address you. Surely the hour is not for the head but for the heart, out of the abundance of which I may be able to express, however feebly, my gratitude for the many kindnesses I have received from the profession of this country during the past twenty-one years, and from you, my dear colleagues of this state and city, during the sixteen years I have dwelt among you. Truly I can say that I have lived my life in our beloved profession—perhaps too much! but whatever success I have had has come directly through it, and my devotion is only natural. Few men have had more from their colleagues than has fallen to my lot. As an untried young man my appointment at McGill College came directly through friends in the faculty who had confidence in me as a student. In the ten happy years I lived in Montreal I saw few but physicians and students, among whom I was satisfied to work—and to play. In Philadelphia the hospitals and the societies absorbed the greater part of my time, and I lived the peaceful life of a student with students. An ever-widening circle of friends in the profession brought me into closer contact with the public, but I have never departed from my ambition to be first of all a servant of my brethren, willing and anxious to do anything in my power to help them. Of my life here you all know I have studied to be quiet and to do my own business and to walk honestly toward them that are without; and one of my chief pleasures has been to work

among you as a friend, sharing actively in your manifold labours. But when to the sessions of sweet, silent thought I summon up the past, not what I have done, but the many things I have left undone, the opportunities I have neglected, the battles I have shirked, the precious hours I have wasted—these rise up in judgement.

A notable period it has been in our history through which we have lived, a period of reconstruction and renovation, a true renaissance, not only an extraordinary revival of learning, but a complete transformation in our educational methods; and I take pride in the thought that, in Philadelphia and in Baltimore, I have had the good fortune to be closely associated with men who have been zealous in the promotion of great reforms, the full value of which we are too close to the events to appreciate. On the far-reaching influence of these changes time will not permit us to dwell. I propose to consider another aspect of our work of equal importance, neither scientific nor educational, but what may be called humanistic, as it deals with our mutual relations and with the public.

Nothing in life is more glaring than the contrast between possibilities and actualities, between the ideal and the real. By the ordinary mortal, idealists are regarded as vague dreamers, striving after the impossible; but in the history of the world how often have they gradually moulded to their will conditions the most adverse and hopeless! They alone furnish the *Geist* that finally animates the entire body and makes possible reforms and even resolutions. Imponderable, impalpable, more often part of the moral than of the intellectual equipment, are the subtle qualities so hard to define, yet so potent in everyday life, by which these fervent

souls keep alive in us the reality of the ideal. Even in a lost cause, with aspirations utterly futile, they refuse to acknowledge defeat, and, still nursing an unconquerable hope, send up the prayer of faith in face of a scoffing world. Most characteristic of aspirations of this class is the petition of the Litany in which we pray that to the nations may be given 'unity, peace, and concord.' Century after century from the altars of Christendom this most beautiful of all prayers has risen from lips of men and women, from the loyal souls who have refused to recognize its hopelessness, with the war-drums ever sounding in their ears. The desire for unity, the wish for peace, the longing for concord, deeply implanted in the human heart, have stirred the most powerful emotions of the race, and have been responsible for some of its noblest actions. It is but a sentiment, you may say : but is not the world ruled by feeling and by passion ? What but a strong sentiment baptized this nation in blood ; and what but sentiment, the deep-rooted affection for country which is so firmly implanted in the hearts of all Americans, gives to these states to-day unity, peace, and concord ? As with the nations at large, so with the nation in particular ; as with people, so with individuals ; and as with our profession, so with its members, this fine old prayer for unity, peace, and concord, if in our hearts as well as on our lips, may help us to realize its aspirations. What some of its lessons may be to us will be the subject of my address.

UNITY

Medicine is the only world-wide profession, following everywhere the same methods, actuated by the same ambitions, and pursuing the same ends. This homo-

geneity, its most characteristic feature, is not shared by the law, and not by the Church, certainly not in the same degree. While in antiquity the law rivals medicine, there is not in it that extraordinary solidarity which makes the physician at home in any country, in any place where two or three sons of men are gathered together. Similar in its high aims and in the devotion of its officers, the Christian Church, widespread as it is, and saturated with the humanitarian instincts of its Founder, yet lacks that catholicity—*urbi et orbi*—which enables the physician to practise the same art amid the same surroundings in every country of the earth. There is a unity, too, in its aims—the prevention of diseases by discovering their causes, and the cure and relief of sickness and suffering. In a little more than a century a united profession, working in many lands, has done more for the race than has ever before been accomplished by any other body of men. So great have been these gifts that we have almost lost our appreciation of them. Vaccination, sanitation, anaesthesia, antiseptic surgery, the new science of bacteriology, and the new art in therapeutics have effected a revolution in our civilization to which can be compared only the extraordinary progress in the mechanical arts. Over the latter there is this supreme advantage, it is domestic—a bedroom revolution, which sooner or later touches each one of us, if not in person, in those near and dear—a revolution which for the first time in the history of poor, suffering humanity brings us appreciably closer to that promised day when the former things should pass away, when there should be no more unnecessary death, when sorrow and crying should be no more, and there should not be any more pain.

One often hears as a reproach that more has been

done in the prevention than in the cure of disease. It is true ; but this second part of our labours has also made enormous progress. We recognize to-day the limitations of the art ; we know better the diseases curable by medicine, and those which yield to exercise and fresh air ; we have learned to realize the intricacy of the processes of disease, and have refused to deceive ourselves with half-knowledge, preferring to wait for the day instead of groping blindly in the dark or losing our way in the twilight. The list of diseases which we can positively cure is an ever-increasing one, the number of diseases the course of which we can modify favourably is a growing one, the number of incurable diseases (which is large, and which will probably always be large) is diminishing—so that in this second point we may feel that not only is the work already done of the greatest importance, but that we are on the right path, and year by year as we know disease better we shall be able to treat it more successfully. The united efforts of countless workers in many lands have won these greatest victories of science. Only by ceaseless co-operation and the intelligent appreciation by all of the results obtained in each department has the present remarkable position been reached. Within a week or ten days a great discovery in any part of the world is known everywhere, and, while in a certain sense we speak of German, French, English, and American medicine, the differences are trifling in comparison with the general similarity. The special workers know each other and are familiar with each other's studies in a way that is truly remarkable. And the knowledge gained by the one, or the special technic he may devise, or the instrument he may invent is at the immediate disposal of all. A new life-saving operation of the first class devised by a surgeon

in Breslau would be performed here the following week. A discovery in practical medicine is common property with the next issue of the weekly journals.]

A powerful stimulus in promoting this wide organic unity is our great international gatherings—not so much the International Congress of the profession, which has proved rather an unwieldy body, but of the special societies which are rapidly denationalizing science. In nearly every civilized country medical men have united in great associations which look after their interests and promote scientific work. It should be a source of special pride to American physicians to feel that the national association of this country—the American Medical Association—has become one of the largest and most influential bodies of the kind in the world. We cannot be too grateful to men who have controlled its course during the past ten years. The reorganization so efficiently carried out has necessitated a readjustment of the machinery of the state societies, and it is satisfactory to know that this meeting of our state society, the first held under the new conditions, has proved so satisfactory. But in the whole scheme of readjustment nothing commands our sympathy and co-operation more than the making of the country societies, the materials out of which the state and national associations are built. It is not easy at first to work out such a scheme in full detail, and I would ask of the members of this body not only their co-operation, but an expectant consideration, if the plan at first does not work as smoothly as could be desired. On the county members I would urge the support of a plan conceived on broad national lines—on you its success depends, and to you its benefits will chiefly come.

Linked together by the strong bonds of community

of interests, the profession of medicine forms a remarkable world-unit, in the progressive evolution of which there is a fuller hope for humanity than in any other direction.

Concentration, fusion, and consolidation are welding together various subunits in each nation. Much has been done, much remains to do ; and to three desiderata I may refer briefly.

In this country reciprocity between the state licensing boards remains one of the most urgent local needs. Given similar requirements, and examinations practically of the same character, with evidence of good character, the state board should be given power to register a man on payment of the usual fee. It is preposterous to restrict in his own country, as is now done, a physician's liberty. Take a case in point : A few months ago a man who is registered in three states, an able, capable practitioner of twenty years' standing, a hard student in his profession, a physician who has had charge of some of the most important lives of this country, had to undergo another examination for licence. What an anomaly ! What a reflection on a united profession ! I would urge you all most strongly to support the movement now in progress to place reciprocity on a proper basis. International reciprocity is another question of equal importance, but surrounded with greater difficulties ; and, though a long way off, it will come within this century.

The second urgent need is a consolidation of many of our medical schools. Within the past twenty-five years conditions have so changed that the tax on the men in charge of the unendowed schools has become ever more burdensome. In the old days of a faculty with seven professors, a school with 300 students was

a good property, paying large salaries, but the introduction of laboratory and practical teaching has so increased the expenses that very little is now left for distribution at the end of the year. The students' fees have not increased proportionately, and only the self-sacrifice and devotion of men who ungrudgingly give their time, and often their means, save a hopeless situation. A fusion of the schools is the natural solution of the problem. Take a concrete example: A union of three of the medical schools of this city would enable the scientific departments to be consolidated at an enormous saving of expense and with a corresponding increase in efficiency. Anatomy, physiology, pathology, physiologic chemistry, bacteriology, and pharmacology could be taught in separately organized departments which the funds of the united school could support liberally. Such a school could appeal to the public for aid to build and endow suitable laboratories. The clinical work could be carried on at the separate hospitals, which would afford unequalled facilities for the scientific study of disease. Not only in this city, but in Richmond, in Nashville, in Columbus, in Indianapolis, and in many cities a 'merger' is needed. Even the larger schools of the larger cities could 'pool' their scientific interests to the great advantage of the profession.

And the third desideratum is the recognition by our homoeopathic brethren that the door is open. It is too late in this day of scientific medicine to prattle of such antique nonsense as is indicated in the 'pathies.' We have long got past the stage when any 'system' can satisfy a rational practitioner, long past the time when a difference of belief in the action of drugs—the most uncertain element in our art!—should be allowed to separate men with the same noble traditions, the same

hopes, the same aims and ambitions. It is not as if our homoeopathic brothers are asleep ; far from it, they are awake—many of them at any rate—to the importance of the scientific study of disease, and all of them must realize the anomaly of their position. It is distressing to think that so many good men live isolated, in a measure, from the great body of the profession. The original grievous mistake was ours—to quarrel with our brothers over infinitesimals was a most unwise and stupid thing to do. That we quarrel with them now is solely on account of the old Shibboleth under which they practise. Homoeopathy is as inconsistent with the new medicine as is the old-fashioned polypharmacy, to destruction of which it contributed so much. The rent in the robe of Aesculapius, wider in this country than elsewhere, could be repaired by mutual concessions—on the one hand by the abandonment of special designations, and on the other by an intelligent toleration of therapeutic vagaries which in all ages have beset the profession, but which have been mere flies on the wheels of progress.

PEACE

Many seek peace, few pursue it actively, and among these few we, alas! are not often to be found. In one sense every one of us may be asked the question which Jehu returned to Joram: 'What hast thou to do with peace?' since our life must be a perpetual warfare, dominated by the fighting spirit. The physician, like the Christian, has three great foes—ignorance, which is sin ; apathy, which is the world ; and vice, which is the devil. There is a delightful Arabian proverb, two lines of which run : 'He that knows not, and knows not that

he knows not, is a fool. Shun him. He that knows not, and knows that he knows not, is simple. Teach him.' To a large extent these two classes represent the people with whom we have to deal. Teaching the simple and suffering the fools gladly, we must fight the wilful ignorance of the one and the helpless ignorance of the other, not with the sword of righteous indignation, but with the skilful weapon of the tongue. On this ignorance the charlatan and the quack live, and it is by no means an easy matter to decide how best to conduct a warfare against these wily foes, the oldest and most formidable with whom we have to deal. As the incomparable Fuller remarks: 'Well did the poets feign Aesculapius and Circe brother and sister, . . . for in all times (in the opinion of the multitude) witches, old women, and impostors have had a competition with doctors.' Education of the public of a much more systematic and active kind is needed. The congress on quackery which is announced to take place in Paris, with some twenty-five subjects for discussion, indicates one important method of dealing with the problem. The remarkable exhibit held last year in Germany of everything relating to quacks and charlatans did an immense good in calling attention to the colossal nature of the evil. A permanent museum of this sort might well be organized in Washington in connexion with the Department of Hygiene. It might be worth while to imitate our German brethren in a special national exhibit, though I dare say many of the most notorious sinners would apply for large space, not willing to miss the opportunity for a free advertisement! One effective measure is enforced in Germany: any proprietary medicine sold to the public must be submitted to a government analyst, who prepares a statement (as to its composition, the price

of its ingredients, &c.), which is published at the cost of the owner of the supposed remedy in a certain number of the daily and weekly papers.

By far the most dangerous foe we have to fight is apathy—indifference from whatever cause, not from a lack of knowledge, but from carelessness, from absorption in other pursuits, from a contempt bred of self-satisfaction. Fully 25 per cent. of the deaths in the community are due to this accursed apathy, fostering a human inefficiency, and going far to counterbalance the extraordinary achievements of the past century. Why should we take pride in the wonderful railway system with which enterprise and energy have traversed the land, when the supreme law, the public health, is neglected? What comfort in the thought of a people enjoying great material prosperity when we know that the primary elements of life (on which even the old Romans were our masters) are denied to them? What consolation does the 'little red school-house' afford when we know that a Lethean apathy allows toll to be taken of every class, from the little tots to the youths and maidens? Western civilization has been born of knowledge, of knowledge won by hard, honest sweat of body and brain, but in many of the most important relations of life we have failed to make that knowledge effective. And, strange irony of life, the lesson of human efficiency is being taught us by one of the little nations of the earth, which has so far bettered our instruction that we must again turn eastward for wisdom. Perhaps in a few years our civilization may be put on trial, and it will not be without benefit if it arouses the individual from apathy and makes him conscious of the great truth that only by earnest individual human effort can knowledge be made effective, and if it arouses com-

munities from an apathy which permits mediaeval conditions to prevail without a protest.

Against our third great foe—vice in all its forms—we have to wage an incessant warfare, which is not less vigorous because of the quiet, silent kind. Better than any one else the physician can say the word in season to the immoral, to the intemperate, to the uncharitable in word and deed. Personal impurity is the evil against which we can do most good, particularly to the young, by showing the possibility of the pure life and the dangers of immorality. Had I time, and were this the proper occasion, I would like to rouse the profession to a sense of its responsibility toward the social evil—the black plague which devastates the land. I can but call your attention to an important society, of which Dr. Prince Morrow of New York is the organizer, which has for one of its objects the education of the public on this important question. I would urge you to join in a crusade quite as important as that in which we are engaged against tuberculosis.

CONCORD

Unity promotes concord—community of interests, the same aims, the same objects give, if anything can, a feeling of comradeship, and the active co-operation of many men, while it favours friction, lessens the chances of misunderstanding and ill will. One of the most gratifying features of our professional life is the good feeling which prevails between the various sections of the country. I do not see how it could be otherwise. One has only to visit different parts and mingle with the men to appreciate that everywhere good work is being done, everywhere an earnest desire to elevate the

standard of education, and everywhere the same self-sacrificing devotion on the part of the general practitioner. Men will tell you that commercialism is rife, that the charlatan and the humbug were never so much in evidence, and that in our ethical standards there has been a steady declension. These are the Elijahs who are always ready to pour out their complaints, mourning that they are not better than their fathers. Few men have had more favourable opportunities than I have had to gauge the actual conditions in professional private life, in the schools, and in the medical societies, and as I have seen them in the past twenty years I am filled with thankfulness for the present and with hope for the future. The little rift within the lute is the absence in many places of that cordial professional harmony which should exist among us. In the larger cities professional jealousies are dying out. Read Charles Caldwell's *Autobiography* if you wish for spicy details of the quarrels of the doctors in the first half of the last century in this country. I am sorry to say the professors have often been the worst offenders, and the rivalry between medical schools has not always been friendly and courteous. That it still prevails to some extent must be acknowledged, but it is dying out, though not so rapidly as we could wish. It makes a very bad impression on the public, and is often a serious stumbling-block in the way of progress. Only the other day I had a letter from a most intelligent and appreciative layman who was interested in a large hospital scheme about which I had been consulted. I quote this sentence from it in sorrow, and I do so because it is written by a strong personal friend of the profession, a man who has had long and varied experience with us: 'I may say to you that one of the distressing bewilderments of the layman

who only desires the working out of a broad plan is the extraordinary bitterness of professional jealousy between not only schoolmen and non-schoolmen, but between schoolmen themselves, and the reflections which are cast on one another as belonging to that clique, which makes it exceedingly difficult for the layman to understand what way there is out of these squabbles.'

The national and special societies, and particularly the American Medical Association, have brought men together and have taught them to know each other and to appreciate the good points which at home may have been overlooked. As Dr. Brush said yesterday in his address, it is in the smaller towns and country districts that the conditions are most favourable for mutual misunderstandings. Only those of us who have been brought up in such surroundings can appreciate how hard it is for physicians to keep on good terms with each other. The practice of medicine calls equally for the exercise of the heart and the head; and when a man has done his best, to have his motives misunderstood and his conduct of a case harshly criticized, not only by the family, but by a colleague who has been called in, small wonder, when the opportunity arises, if the old Adam prevails and he pays in kind. So far as my observation goes, there are three chief causes for the quarrels of doctors. The first is lack of proper friendly intercourse, by which alone we can know each other. It is the duty of the older man to look on the younger one who settles near him not as a rival, but as a son. He will do to you just what you did to the old practitioner, when, as a young man, you started—get a good many of your cases; but if you have the sense to realize that this is inevitable, unavoidable, and the way of the world, and if you have the sense to talk over, in a friendly way, the first delicate

situation that arises, the difficulties will disappear and recurrences may be made impossible. The young men should be tender with the sensibilities of their seniors, deferring to their judgement and taking counsel with them. If young graduates could be taken more frequently as assistants or partners, the work of the profession would be much lightened, and it would promote amity and good fellowship. A man of whom you may have heard as the incarnation of unprofessional conduct, and who has been held up as an example of all that is pernicious, may be, in reality, a very good fellow, the victim of petty jealousies, the mark of the arrows of a rival faction; and you may, on acquaintance, find that he loves his wife and is devoted to his children, and that there are people who respect and esteem him. After all, the attitude of mind is the all-important factor in the promotion of concord. When a man is praised, or when a young man has done a good bit of work in your special branch, be thankful—it is for the common good. Envy, that pain of the soul, as Plato calls it, should never for a moment afflict a man of generous instincts who has a sane outlook in life. The men of rival schools should deliberately cultivate the acquaintance of each other and encourage their students and the junior teachers to fraternize. If you hear that a young fellow just starting has made mistakes or is a little ‘off colour,’ go out of your way to say a good word to him, or for him. It is the only cure; any other treatment only aggravates the malady.

The second great cause is one over which we have direct control. The most widespread, the most pernicious of all vices, equal in its disastrous effects to impurity, much more disastrous often than intemperance, because destructive of all mental and moral nobility, as

are the others of bodily health, is uncharitableness—the most prevalent of modern sins, peculiarly apt to beset all of us, and the chief enemy to concord in our ranks. Oftentimes it is a thoughtless evil, a sort of tic or trick, an unconscious habit of mind and tongue which gradually takes possession of us. No sooner is a man's name mentioned than something slighting is said of him, or a story is repeated which is to his disadvantage, or the involuntary plight of a brother is ridiculed, or even his character is traduced. In chronic and malign offenders literally 'with every word a reputation dies.' The work of a school is disparaged, or the character of the work in a laboratory is belittled; or it may be only the faint praise that damns, not the generous meed from a full and thankful heart. We have lost our fine sense of the tragic element in this vice, and of its debasing influence on the character. It is interesting that Christ and the Apostles lashed it more unsparingly than any other. Who is there among us who does not require every day to lay to heart that counsel of perfection: 'Judge not according to the appearance, but judge righteous judgement'? One of the apostles of our profession, Sir Thomas Browne, has a great thought on the question:

While thou so hotly disclaimest the devil, be not guilty of diabolism. Fall not into one name with that unclean spirit, nor act his nature whom thou so much abhorrest—that is, to accuse, calumniate, backbite, whisper, detract, or sinistrously interpret others. Degenerous depravities, and narrow-minded vices! not only below St. Paul's noble Christian, but Aristotle's true gentleman. Trust not with some that the Epistle of St. James is apocryphal, and so read with less fear that stabbing truth, that in company with this vice thy religion is in vain. Moses broke the tables without breaking of the law; but where charity is broke the law itself is shattered, which cannot be whole without love, which is the fulfilling of it. Look humbly upon thy virtues; and though

thou art rich in some, yet think thyself poor and naked without that crowning grace, which thinketh no evil, which envieth not, which beareth, hopeth, believeth, endureth all things. With these sure graces, while busy tongues are crying out for a drop of cold water, mutes may be in happiness, and sing the Trisagion in heaven.

And the third cause is the wagging tongue of others who are too often ready to tell tales and make trouble between physicians. There is only one safe rule—never listen to a patient who begins with a story about the carelessness and inefficiency of Dr. Blank. Shut him or her up with a snap, knowing full well that the same tale may be told of you a few months later. Fully half of the quarrels of physicians are fomented by the tittle-tattle of patients, and the only safeguard is not to listen. Sometimes it is impossible to check the flow of imprecation and slander; and then apply the other rule—perfectly safe, and one which may be commended as a good practice—never believe what a patient tells you to the detriment of a brother physician, even though you may think it to be true.

To part from the profession of this country and from this old faculty, which I have learned to love so dearly, is a great wrench, one which I would feel more deeply were it not for the nearness of England, and for the confidence I feel that I am but going to work in another part of the same vineyard, and were it not for the hope that I shall continue to take interest in your affairs and in the welfare of the medical school to which I owe so much. It may be that in the hurry and bustle of a busy life I have given offence to some—who can avoid it? Unwittingly I may have shot an arrow o'er the house and hurt a brother—if so, I am sorry, and I ask his pardon. So far as I can read my heart I leave you in charity with all. I have striven with none, not, as

Walter Savage Landor says, because none was worth the strife, but because I have had a deep conviction of the hatefulness of strife, of its uselessness, of its disastrous effects, and a still deeper conviction of the blessings that come with unity, peace, and concord. And I would give to each of you, my brothers—you who hear me now, and to you who may elsewhere read my words—to you who do our greatest work labouring incessantly for small rewards in towns and country places—to you the more favoured ones who have special fields of work—to you teachers and professors and scientific workers—to one and all, throughout the length and breadth of the land—I give a single word as my parting commandment:

‘It is not hidden from thee, neither is it far off. It is not in heaven, that thou shouldest say, Who shall go up for us to heaven, and bring it unto us, that we may hear it, and do it? Neither is it beyond the sea, that thou shouldest say, Who shall go over the sea for us, and bring it unto us, that we may hear it, and do it? But the word is very nigh unto thee, in thy mouth, and in thy heart, that thou mayest do it’—CHARITY.

TYPHOID FEVER AND TUBERCULOSIS.¹

BY

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Two patients in the wards of the Johns Hopkins Hospital illustrate the important relations which may exist between typhoid fever and tuberculosis.

1. The diseases may be concurrent. A person with chronic tuberculosis may contract the fever. Of 80 autopsies in typhoid fever, 4 presented marked tuberculous lesions. Less frequently miliary tuberculosis and typhoid fever may occur together.

2. Enteric fever may be mistaken for tuberculosis. This, I think, is rare. You will find on page 464 of Series III of "Studies in Typhoid Fever,"² a case in which for nearly 2 weeks we suspected a tuberculous pneumonia and looked for tubercle bacilli. The disease began with a slight fever, headache, cough, and on examination there was impaired resonance in the right infrascapular region with tubular breathing and moist rales. Ten days after admission to the ward the left lower lobe was involved. The patient had a bad family history, one sister having died of tuberculosis, and for the first 2 weeks we were very anxious indeed. Then the picture changed entirely. She had a continuously high temperature, rose spots appeared, the spleen enlarged, and the symptoms of typhoid fever became well marked. The Widal reaction was not positive until the end of the third week. Such cases are not common.

3. Very much more frequently tuberculosis is mistaken for typhoid fever, a point which these cases illustrate. There are 5 types of tuberculous infection which may simulate typhoid fever—the acute miliary form, tuberculous meningitis, tuberculous peritonitis, the acute toxemia of certain local lesions, and forms of pulmonary tuberculosis. You will find much in the literature on

¹ Clinical Remarks, Johns Hopkins Hospital, October 24, 1903.

² Johns Hopkins Hospital Reports, Vol. viii.

the question of the diagnosis in the first three of these groups, but not on the last two, and, judging from my personal experience, the profession is not fully alive to the importance of the subject.

The patient, H. L. D., a man aged 30 (Hosp. No. 44,014) was admitted on September 13, 1903, complaining of shortness of breath, pleuritic pains, and cough. His habits had been fairly good. He had worked hard. His present illness had begun 2 weeks before admission with pain in the left chest and back. He did not feel very ill, and continued at work until September 13, the day before admission. He thought he had had some fever at times. On September 12, he had epistaxis and 2 chills in quick succession. On the night of September 11 and ever since he has had fever. There had been no cough and no diarrhea. Altogether the features of onset resembled very much those of typhoid, and on admission he had a temperature of 102° , pulse 108, respirations 24. The leukocytes were 5,500 per centimeter. He looked ill; had a heavy drowsy expression. The abdomen looked natural. The spleen was not felt. There were no rose spots. On examining the lungs, there was impaired resonance in the left infrascapular region with distant tubular breathing, distinctly blowing on expiration, and on coughing a shower of fine, crepitant rales. The patient coughed a little every day, but there was at first no sputum. On September 17, Dr. Fletcher noticed that he was a little cyanosed, and there was on the left side of the chest a leathery friction. The sputum on this day was examined for tubercle bacilli, but was negative. His general condition remained good. The temperature ranged between 102° and 103° , and was very steady. There were no sweats. In the next few days there was no special change in the character of the pulmonary signs. The involvement of the left lower lobe was marked, and the tubular breathing became more distinct. There were no rose spots, and the nature of the case was doubtful. The leukocytes were not increased. The Widal reaction was negative. The absence of more positive signs of typhoid fever and the absence of rose spots and the Widal reaction, made the marked pulmonary features more significant, and the sputum was examined with great care. On September 25, a few bacilli were noticed, which were regarded as suspicious, and on September 26, well-characterized tubercle bacilli were present. Elastic tissue was not found. The local signs persisted at the left base, but the fever gradually subsided, the respirations were not above 24, and on September 27, the temperature became normal. The chart is very suggestive of a mild typhoid subsiding in the third week, and had not the pulmonary symptoms been pronounced and the tubercle bacilli so definite, I think we should have had much difficulty in making a positive diagnosis. At present there is impairment of resonance at the left base with distant tubular breathing. The cough has lessened, he has had no sputum, and he looks as though he were going to do very well.

The issue in these cases is not always so satisfactory. We had a sad lesson 5 or 6 years ago.

A medical student, Edward S. O., aged 26, was admitted to Ward C on June 13, 1898, complaining of fever and headache and cough. His father had died 18 years before of tuberculosis, and two uncles on the mother's side had died of tuberculosis. He

had been very healthy and well. He had just finished his examination and had naturally been somewhat "used up." On Saturday, June 4, he had slept in a draught, and on the following morning he was very heavy and drowsy. On Monday morning he took a long walk, began to feel feverish and had creepy, chilly sensations. He felt very badly on Tuesday and started for Baltimore. He had a little diarrhea that week, headache and fever persisted, and on Sunday morning, June 12, he began to cough. He had loss of appetite; no diarrhea.

On admission the temperature was 101.3° ; pulse 96. Leukocytes 8,200. He felt very much prostrated, but on coughing he felt no pain; he had no expectoration. No rose spots were seen. The Widal reaction was not present. He was dull and drowsy, complained of severe headache, and was easily excited. The lungs were very carefully examined on June 13 and June 14, and there were no special signs detected. Throughout the month of June the fever persisted, once reaching 103° , usually about 102° in the evening. The Widal reaction was not present, there were no rose spots, and the spleen was not enlarged. The tongue was slightly coated and the bowels were constipated. There was no diazo reaction in the urine, no albumin, no tube casts. When I left town about the middle of the month my impression was that he had typhoid fever. Throughout July the condition remained practically the same. There were repeated notes of the physical examination. The temperature range was perhaps a little lower, particularly the evening record, and after July 15 it rarely rose in the evening above 101° , and in the morning was usually normal. The spleen was not palpable. After the middle of July the tongue was clean. The only suspicious points at all were a little pain on deep inspiration, and there were a few fine rales heard at both bases. There was no cough. On July 26 it had become evident that there was trouble in the right lung. There was a tympanitic note at the right apex; there was flatness in the lower interscapular region and in the infrascapular area, with tubular breathing and fine moist rales. He seemed, however, to be doing very well. The appetite was good and he had no cough and no expectoration. By this time the possibility of tuberculosis was entertained, but it was not possible to say definitely. On July 28, the red blood-corpuscles were about 4,000,000; there was no leukocytosis. Early in August he improved a great deal. The temperature was rarely above 100.5° and the respirations were only 20. He had little or no cough, and he seemed very much better. He left the hospital on August 10. There was still an area of consolidation at the right base. Subsequently he grew very much worse, the tuberculosis became quite manifest and he went to the Adirondacks, where he was under the care of Dr. Trudeau for several years.

Dr. Thayer and I were criticised very severely by the family for having regarded this case at the outset as one of typhoid fever. In truth we never reached a definite conclusion, and the diagnosis which Dr. Thayer put down on the history sheet was "Continued Fever; Pneumonia (Tuberculous?)." Under the circumstances I do not think that we could have done anything else, but the case illustrates a serious clinical difficulty which you will find very hard to meet.

There is in the private ward at present another case which illustrates the readiness with which this mistake may be made.

A young married woman, aged 26 (Hosp. No. 44,466); with a good family history, noticed in May of this year that she had some "bubbling feelings" on the left side. She was pregnant at the time; her child was born June 13, shortly after which time she began to have a cough, with pain in the left shoulder. Ten days after delivery she got up, but she felt weak and feeble and she had cough and night-sweats. She was sent to the country and in the fourth week in July she was confined to bed with fever. The temperature rose to between 102° and 103° , and the diagnosis of typhoid fever was made. She was placed on a liquid diet. She continued in bed, supposed to have typhoid or typhomalarial fever, until the middle of September, when she was allowed to get up. Shortly afterward the fever reappeared, of a remittent type. She had a great deal of cough and mucopurulent expectoration. She lost in weight, the fever persisted and she applied at the hospital on October 22, believing that she had some sequel of typhoid fever.

The chest showed marked asymmetry, owing to shrinkage of the left side. The muscles of the left shoulder girdle were wasted, and there were signs of extensive disease in the left lung. The sputum was profuse, mucopurulent, and contained very many tubercle bacilli. Her temperature-range while she was in the hospital was from 99.5° to 103° .

Here the pulmonary tuberculosis was latent in onset, probably before the birth of her baby. As is so often the case, rapid progress was made during lactation, and the fever was mistaken for typhoid. Apparently, no suspicion had been entertained of tuberculosis.

4. In rare cases pulmonary consumption follows typhoid fever.

You not infrequently see the statement made that patients convalescent from this disease are particularly prone to tuberculosis. I do not think the facts warrant this, and I believe very many of these cases are tuberculous from the outset. The original attack, as in the case of the young man you have just seen, simulates typhoid fever so closely that the physician is deceived. Then pulmonary symptoms supervene, and it is thought that the tuberculosis has come on after typhoid fever. Every year I see one or two cases of this sort, and I am glad to have had this opportunity of bringing the subject before you, as one of great importance which has scarcely received the attention it deserves.

OCHRONOSIS

THE PIGMENTATION OF CARTILAGES, SCLEROTICS, AND SKIN IN ALKAPTONURIA

BY

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OCHRONOSIS :

THE PIGMENTATION OF CARTILAGES, SCLEROTICS, AND SKIN IN ALKAPTONURIA.

HERETOFORE ochronosis has been a pathological curiosity ; the two cases here reported in alkaptonuria show that it may have interesting clinical features.

In 1866 Virchow¹ described a remarkable blackening of the cartilages in the body of a man, aged 67 years, who had died from aneurysm. The colour was coal black (as shown in his figures), not ochre-coloured or yellow ; but it was not ordinary melanosis, and recognising the unique character of the condition Virchow called it ochronosis. Years passed before a second case was described by Boström,² that of a woman, aged 44 years, who had died from strangulated umbilical hernia. The same ebony-black discolouration of the cartilages was present. Then in 1892 Hansemann³ described a third case, the patient being a male, aged 41 years, with general œdema and aneurysm of the left ventricle. He had had melanuria for 18 years. In a recently issued number of the *Deutsches Archiv für Klinische Medizin* Langstein and Meyer state that the examination of long-kept urine shows that this was not a case of alkaptonuria. There was no reduction of copper and no homogentisic acid could be found. Heile⁴

¹ Virchow's Archiv, 1866, Band xxxvii., p. 212.

² Virchow's Festschrift, Band ii., 1891, p. 177.

³ Berliner Klinische Wochenschrift, 1892, Band xxix., p. 660.

⁴ Virchow's Archiv, 1900, Band clx., p. 148.

recorded the fourth and fifth cases, one being that of a woman, aged 36 years, who had died from peritonitis after ruptured tubal pregnancy, and the other that of a woman, aged 52 years, with chronic leg ulcer and mitral valve disease. The sixth case was reported by Hecker and Wolf.⁵ The patient was a man, aged 73 years, with long-standing melanuria and chronic endocarditis. In the eyes on each side some three or four millimetres from the corneal border there were black spots on the sclerotics. The urine was sometimes normal in colour when passed and sometimes brownish. It became black on standing for a day or two. The darkening was present for 11 years but was not constant. Blood, bile-pigment, indican, pyrocatechin, and drug pigments were excluded. It is distinctly stated that the urine did not reduce copper. Hecker and Wolf came to the conclusion that the reactions were those of melanuria. Post mortem there was the ordinary ochronotic blackening of the cartilages, arteries, &c. I am indebted to Dr. A. Garrod for this abstract from the *Festschrift* of the Dresden Hospital and he states that it is pretty certain this was not a case of alkaptonuria. The seventh case is recorded by H. Albrecht,⁶ to whom is due the credit of suggesting the association of the condition with alkaptonuria. In a man, aged 47 years, who had died from pulmonary tuberculosis, the urine was dark-coloured and reduced the sulphate of copper, but the presence of alkaptonuria was not proved, for no homogentisic acid was obtained from it. After a week in the hospital he died and the necropsy showed a general ochronosis. A point of special interest was the grey-blue colour of the inner part of the ears, as if due to dilated veins.

I am able to report two cases of ochronosis in alkaptonuria in which the condition could be recognised clinically by the deep pigmentation of the cartilages of the ears and of the sclerotics, and in one by a remarkable ebony-black discolouration of the skin of the nose and cheeks.

⁵ *Festschrift*, Dresden Hospital, 1899, p. 325.

⁶ *Zeitschrift für Heilkunde*, 1902, Band xxiii., p. 366.

CASE 1.—A man, aged 57 years, consulted me on Jan. 16th, 1895, for diabetes and rapid action of the heart. He had been an active business man and a successful politician. I did not question the existence of diabetes, as during a prolonged residence in Europe he had been under the care of several eminent colleagues in Berlin, Paris, and London, one of whom had referred him to me. After repeated examinations Dr. Fletcher determined that the copper-reducing substance was not glucose and the case formed the basis of his paper on alkaptonuria in the *New York Medical Journal* in 1898. I need not refer in any detail to the condition of the urine in this case other than to state that it is never black when passed but darkens after a few hours. At my first examination I was impressed by a remarkable appearance of the sclerotics which showed small V-shaped areas of deep pigmentation near the cornea. I thought it might be the result of old hæmorrhages, but the patient said that the condition had gradually come on and that it had annoyed him at first but that he now thought nothing of it. There was also a slight pigmentation of the nose and on the cheeks which looked like very thickly set comedones. As he left the room my attention was directed to the deep blue colour of the inner surface of the ears. I have seen the patient at intervals during the past eight years and have taken an increased interest in the deepening pigmentation of his face, eyes, and ears. I searched the literature at intervals for an explanation but without avail and I consulted Dr. de Schweinitz and Dr. Harry Friedenwald with reference to the pigmentation of the sclerotics. It did not seem to conform with any of the reported cases of this rare condition. Lately the patient came under my care in the private ward of the Johns Hopkins Hospital for anæmia and a weak, irregular heart. The pigmentation has extended considerably in the past six years and is now as follows.

Sclerotics.—The exposed V-shaped portions are of a deep black colour, not in the entire extent, as there are areas of normal colour. The staining is in the sclerotic coat, not in

the conjunctiva, and it does not extend to the covered parts of the eyeballs. Of late years it has become much darker ; there was a brownish tinge in places which has now almost disappeared. There is nothing special to be noticed about the other parts of the eyes. The tarsal cartilages are not affected.

Ears.—From behind and along the free border of the helix the skin looks normal but when looked at from inside there is a remarkable blue-black discolouration, exactly like that produced by dilated veins, as Albrecht remarked. It is deepest in the concha and extends along the antihelix but not to the helix. I did not recognise at first that the pigmentation was in the cartilage. In certain positions and when the light falls into the ears the colour at once attracts attention. It has extended and deepened in the past five years.

Face.—Over the nose and the cheeks, in very much the butterfly distribution of lupus erythematosus, the skin is of a coal-black colour. At his first visit I thought that it was an unusual distribution of very black comedones. The line over the nose is narrow but widens and passes to the cheeks and extends over the malar bones and along the zygomata. There is no thickening of the skin, which can be picked up easily. The colour is remarkable, quite unlike anything seen in the skin in the ordinary pigmentary changes, but at first glance rather suggesting powder marks. Where present it is uniform, not patchy. It is nowhere else on the skin but Dr. Fitcher tells me that small black spots have begun to appear on the back of the hands. One of this patient's sons has alkaptonuria.

CASE 2.—The patient is a brother of the patient in Case 1, his age being 49 years. This was one of the first cases of alkaptonuria described in the United States of America. He had applied for life insurance and had been rejected repeatedly. Dr. Marshall, of the University of Pennsylvania, studied the urine carefully and called the new copper-reduc-

ing substance glycosuric acid. The man remained quite well after he had got over his fright about diabetes. When the first patient was in the hospital this brother visited him frequently, and what was my surprise to find that he too had pigmented sclerotics and ears. The patches in the eyes were small, two vertically placed bands about five millimetres from the corneo-sclerotic junction. They resembled in size and appearance those in his brother's eyes when I first saw him in 1895. The blue-black colour in the ears, not nearly so marked as in Case 1, was confined to the fossæ and could not be seen from behind. The skin was normal, but through it appeared this remarkable leaden colour as though there was a diffuse nævus. The patient had noticed the pigmentation for several years. He was morbidly sensitive about it and it was with the greatest difficulty that I could induce him to come to the clinical laboratory where Dr. Emerson determined the persistence of the alkaptonuria. This patient died in April, 1903, from pneumonia after an illness of a few days. There was no post-mortem examination.

These brothers presented a singularity in gait, walking with a slight bend or incline at the hips. At first I thought the elder brother had had spinal disease but the spine was straight and the motion of the hip-joints was perfect. He had had rheumatic pains in many joints and there were several Heberden's nodes.

Dr. Ogden of Milwaukee writes with reference to his alkaptonuria patient, whose condition was described in the *Zeitschrift für Physiologische Chemie*, 1895, that "the colour of the inside of each concha is a pearly, light-greyish lead-blue, much the colour of the inside of some of our common mussel shells." This is evidently staining of the cartilages similar to that which exists in the two patients here described and in Albrecht's case.

There is no question that these are cases of ochronosis in long-standing alkaptonuria and they support Albrecht's suggestion that the pigmentation of the cartilaginous tissues is associated with the remarkable disturbance of metabolism

which we have heretofore only recognised by the changes in the urine. The condition is thus brought within the range of the clinical physician. Fortunately it is not of much moment, so far as we know, and in the recorded cases there have been no symptoms directly due to the alkaptonuria. Dr. Garrod informs me that there are only two recorded post-mortem examinations in alkaptonuria cases. In Fürbringer's case⁷ the patient, a male, aged 29 years, died from phthisis. There is no mention of the duration of the alkaptonuria. The necropsy was made by Thoma and the description is complete. Blackening with alkalies was looked for in the body fluids, but there is no mention of blackening of the cartilages. In von Moraczewski's case (a woman, aged 43 years) the alkaptonuria was supposed to be of late development. There is no mention of the cartilages in the protocol of the post-mortem examination. Some of the cases of ochronosis have not been in alkaptonuria and, as Dr. Garrod writes, it looks as if possibly even the very few cases described may belong to two distinct classes. Of the three cases in which black urine is mentioned two at any rate seem not to have been in alkaptonuria, and in Albrecht's patient Zdarek could not find in the fresh urine either homogentisic or uroleucic acid.

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⁷ Berliner Klinische Wochenschrift, 1875, Band xii.

THE "PHTHISIOLOGIA" OF RICHARD MORTON, M.D.*

By WILLIAM OSLER, M.D.,
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August 22, 1662—Black Bartholomew's Day, as it has been called—brought sadness and sorrow to many English homes. The enforcement of the Act of Uniformity called for subscription to the Thirty-nine Articles, and enforced the use by all clergymen of the Book of Common Prayer. Among those ejected for refusal to subscribe—2,000 in number, it is said—was a young man, aged twenty-five, the Vicar of Kinver, in Staffordshire, Richard Morton by name. The son of a physician, born in 1637, he had been educated at Oxford, where he took the B.A. in 1656-57, became chaplain to his College and took the M.A. in 1659, and in the same year was appointed to the vicarage of Kinver. From the days of St. Luke there have been many instances of what has been called the angelical conjunction of physic and divinity. In the seventeenth century many men could sign after their names, as did Robert Lovell in his *History of Animals and Minerals* (1661), *Φιλοθεολογιατρονομος*. Following Linacre's example, clerical orders have been taken as a rule by the physician late in life, but Morton, ejected from his living, turned his attention to medicine at a comparatively early age. From Baxter's account, he evidently was a loss to the church. He speaks of him as "a man of great gravity, calmness, sound principles, of no faction, an excellent preacher, of an upright life."

It is not known where Morton studied medicine. On the nomination of the Prince of Orange he was created an M.D. of Oxford in 1670. He settled in London, became a Candidate of the Royal College of Physicians in 1675, and a Fellow in 1679. He prac-

*Read before the Johns Hopkins Hospital Historical Club, January, 1900.

tised in Grey Friar's Court, Newgate Street, and had an unusual measure of success. He became physician-in-ordinary to the King, and enjoyed the confidence both of the profession and of the public. He seems to have been an intimate friend of Sydenham and a strong supporter of his new way in physic. He died in 1698.

His most important work is the *Phthisiologia*, 1689, of which there were six or seven subsequent editions in the succeeding century. Two English translations appeared, one in 1694, and the other in 1720.

His *Pyretologia* appeared in 1692, and is chiefly of value to-day as giving one of the most systematic and thorough accounts of the malarial fevers of that date.

The *Phthisiologia* is one of the first systematic treatises on pulmonary consumption. The writers of that date had, however, not got beyond the classification of phthisis given by Celsus and which embraced the forms of disease with which wasting and atrophy were associated, *i.e.*, atrophica, cachexia and phthisis proper, or consumption.

Morton's title-page of his English edition gives very well his classification: *Phthisiologia: or a Treatise of Consumptions. Wherein the Difference, Nature, Causes, Signs, and Cure of all sorts of Consumptions are explained. Containing Three Books, I. Of Original Consumptions from the whole Habit of the Body; II. Of on Original Consumption of the Lungs. III. Of Symptomatical Consumptions, or such as are the Effects of some other Distempers. Illustrated by particular Cases, and Observations added to every Book. With a Compleat Table of the most Remarkable Things.* Of these, Book II alone concerns us at present. Book I deals with the wasting associated with discharges of all sorts, suppurations, diabetes, dropsies, sweats, etc. Two points may be mentioned in passing. Under what he terms nervous consumption, I think we may recognize Gull's anorexia nervosa, particularly in the history of the two cases which he narrates. Under the section "De Tabe à Diabete," which he calls "Hydrops ad Matulam" (dropsy of the chamber-pot), he describes, for the first time, I believe, the family form in children and notes one case of recovery in childhood.

Morton was one of the first to give a clear account of tubercles in the lungs. Celsus had used the word tubercle and was stated to have introduced it into the language of medicine, but by it he really meant any small round tumor of whatever nature. Mor-



B. Orchard pinx.

W. Elder sculp.

RICHARDUS MORTON M.D.
Colleg. Med. Lond. Soc.

ton's description of tubercle is as follows: "A crude Tubercle or Swelling is bred from the Obstruction of some Glandulous part of the Lungs; to wit, when a greater quantity of *Serum*, or Water is separated from the Blood, than is thrown out by the Duct of the Glandule: From whence it comes to pass, that as the Part affected being too much distended by the Humour that is imprisoned in it, is deprived of its natural Tone, and thereupon is no longer able to spew or throw out the *Serum*, or Water that flows into it, or is separated; so likewise the Humour, that is so shut up, not being any more renewed by an influx of fresh Humour, does by degrees grow dry and hard from the Natural heat of the Part: From whence arises a hardness, that resists a pressure, or a Tubercle (of which we are now speaking) which in progress of time, after the natural Tone of the Part is in this manner destroyed, is wont to be inflamed, and to turn to an Aposteme sooner or later, according to the Nature of the *Lympha*, or included Humour, and of the Blood, from which it is separated, which indeed is the whole immediate cause of a Consumption of the Lungs, and of the dry cough which attends it."

A very interesting point is that he had a strong belief in the very great prevalence of tuberculosis of the lungs, and he says: "Yea, when I consider with my self, how often in one Year there is cause enough ministered for producing these Swellings, even to those that are wont to observe the strictest Rules of Living, I cannot sufficiently admire that any one, at least after he comes to the Flower of his Youth, can dye without a touch of a Consumption. And without doubt the breeding of these Swellings is so frequent and common, that a Consumption of the Lungs would necessarily be the common Plague of Mankind, if those Swellings did not vanish, or were not removed by Art as easily as they are bred at first: And indeed I have been used to think, not without Reason, that as the more Benign Tubercles are wont to go off of their own accord, and that quickly, so none of them lay the Foundation of this great Disease, of which I am now treating, but only those which are in some degree Malignant, and ill-natur'd, and that are wont to putrefie sooner or later from some peculiar quality in their Nature, from what part soever of the Body they have their Original."

Among the procatartic or predisposing causes he mentions want of exercise, night studies and watchings, a hereditary disposition, an ill-formation of the breast, whether natural or accidental, and infection. The more immediate cause was the taking

of cold and the production of hard swellings, which he takes to be the crude tubercles mentioned by Galen, arising in the glandulous parts of the lungs.

The important point in the prevention of the disease is to be careful in the six non-naturals, in eating and drinking, in sleep, exercise, evacuations, passions of the mind, and the use of "open, fresh, kindly air and such as is free from the smoke of coals." He remarks in conclusion about the prophylaxis of consumption: "But alas! Physicians have very seldom an occasion to give their Advice about preventing this Distemper (when in the beginning perhaps it may be cured as well as other Diseases, although for the most part by neglect it proves fatal) the sick Persons seldom imploying Æsculapius help before the Distemper has run on so far as to be a fatal case, and then they in vain expect Miracles from the Art of Physick, when it is more convenient for them to have the good Counsel of a Minister about the future Salvation of their Souls, and the Advice of a Lawyer about making their last Will."

The diagnostic and pathognomonic signs of the beginning of a pulmonary consumption are three: cough, fever and loss of weight. He gives a very full account of the cough of tuberculosis, and describes the form which has been known by his name, in which the patient coughs until he vomits. The fever of tuberculosis is of two kinds: the inflammatory, which has its beginning from an inflammation of the tubercles in the lungs, and which is similar to other forms of inflammatory fever, and is to be treated in the same way; and the putrid, intermitting fever of tuberculosis, which begins with a chilliness and coldness, proceeding with great heat, and at last ends in profuse and colliquative night sweats. This form accompanies a consumption to the patient's dying day, and is not to be cured with Peruvian bark or any other specific medicine. I do not know that any author previously had given such a good description of the two types of fever which we now recognize.

His description of the marasmus with the Hippocratic face is excellent. The account of the night-sweats is worth reading: "For the Sweats always come on, when the Putrid Fever is going off, to wit, after Midnight. For this Fever (whether it be a Tertian or Quotidian) comes like other Intermitting Fevers at a certain hour (which is about Noon, or a little after) with a manifest chillness, but then proceeding for some hours with a burning Heat, Drought, Restlessness, Vomiting, shortness of Breath, a continual,

fierce and violent Cough, want of Sleep, yes, sometimes also Light-headedness, and a very red color in the Cheeks, proceeding from the Oppression of the Lungs, and those parts that are seated under the Short Ribs: But at length, to wit, about Midnight, it ends in vast and colliquative Sweats. At which time the Patient sleeps quietly, breathes not so short as before, and plentifully coughs up concocted Phlegm without any difficulty or pains, having the Symptoms of the Fever all gone off altogether of their own accord. For at this time the stream of the colliquated Humour is turned from the Lungs, and carried to the Pores of the Skin. And by that means the Patient seems all the morning to be free from a Fever, his Heat is moderate, and his Pulse low, until at length another new fit seizes him, and breaks the Treacherous Peace. And from these remissions of their Fits it often happens that these kind of Consumptive People, even when they are lookt upon as deplorable by others, flatter themselves extremely with the hopes of their Recovery; so that the same Persons that at Night use used to think themselves irrecoverable, and tell those about them they should certainly dye, yet the next Morning they always pluck up their Courage, and in vain entertain the hopes of living long."

The description of the diarrhea and of the throat symptoms, with observations on the condition of the urine and pulse, are those of a skilful, well-trained observer.

Of the varieties of consumption of the lungs he describes an acute and a chronic. He mentions a number of cases, his father's (a very skilful physician) among them, who had cough and fever for many years. He was a strong believer in the cure of consumption in its early stages—"the consumption does admit of a cure as well as other distempers." He confesses that a confirmed consumptive is rarely cured, but "if it be but a small part of the lungs that is ulcerated and the matter be benign . . . the life of the patient may be preserved many years by the careful management of himself." The hereditary consumption, and that got by infection, he says, and those occurring in the young are hardest to cure. "Every consumption, though it be cured, is apt to return, and he that has once been in a consumption, unless he governs himself very regularly, falls back into the same condition."

His section on treatment is far inferior to that on symptomatology. He advises bleeding at the outset, the use of the chalybeate waters, a milk diet, the plentiful use of shell-fish, and testaceous

medicines, that is, prepared coral, crab's eyes, powder of crab's claws, and cray-fish broth. There was a strong opinion prevalent that these hard remedies were very helpful to a cure of consumption. For the cough he used van Helmont's liquid laudanum, but warned against the sudden death that sometimes followed too much opium in the third stage of the disease. The Peruvian bark was his mainstay in the fever, and opiates and milk wherein steel had been quenched several times, for the diarrhea.

One misses the strong statements found in Sydenham as to the value of fresh air in the treatment of the disease. Sydenham states, upon fresh air and horse-back riding, "I am sure that if any physician had a remedy for the curing of a phthisis of equal force with this of riding, he might easily get what wealth he pleased."

In the third book of the treatise are considered the symptomatic consumptions of the lung, such as are the effects of some other distempers. In the section on scrofulous consumptions, by which he means tuberculous adenitis, it would appear that he appreciated the identity of the affection in the glands with that in the lungs. He says, "and what happens in the other glandulous parts happens also in the lungs themselves." "Those who have the King's evil, who are frequently subject to glandulous swellings in other parts, are likewise many times affected with such kind of tubercles even in the lungs themselves." He states that "a scrofulous consumption," by which remember he means a tuberculous adenitis, "is curable when the tubercles are crude."

One of the most interesting sections is that upon a consumption caused by the spitting of blood (the phthisis ab hæmoptoë) which he regards as one of the most fatal and incurable of the forms of consumption.

Another interesting form of consumption very fully described by Morton is that caused by stones "bred in the lungs," which he describes as smooth and chalky and without the least tubercle, or sometimes sharp and angular, causing a tearing of the lungs, with pain and the spitting of blood. He gives three cases of the spitting of lung stones associated with consumption.

A very interesting section is one on the consumption caused by peripneumonia and pleurisy, which pass into apostemes of a great bigness, and which may rupture, either internally into the windpipe, in which case the patient may be suddenly strangled or choked, or externally. He advises, if the patient can bear it, paracentesis when fluctuation is present.

Morton fully appreciated the contagious nature of tuberculosis, as the following passages indicate. I have already mentioned that he placed contagion as one of the causes. In several of his histories he recognizes it. Under scorbutical consumption he gives the history of a Mr. Hunt, who had been from his youth to the seventieth year of his age in a consumptive state. His three sons after the thirtieth year, one after another, "by the right of inheritance" were seized with a consumption, which "carried them off before the emaciated old man died." "The widow of one of them, as well from her grief for the death of her husband as from other causes, and from the taking of cold in often watching with him, and perhaps by infection too (because she lay with him to his dying day) took the disease, but gradually recovered by the use of the Islington waters." Under the phthisis ab hæmoptoë, he mentions a young man, having married a virgin that was a consumptive and who died within a year after marriage, who, a few months after her death, fell into a consumption "by contagion."

ON THE SURGICAL IMPORTANCE OF THE VISCERAL CRISES IN THE ERYTHEMA GROUP OF SKIN DISEASES.

BY WILLIAM OSLER, M.D.,

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THE possibility of mistaking these visceral crises for appendicitis or intussusception or obstruction of the bowel, and handing the patient over to the surgeon for operation, is by no means remote. In Case II. of my series¹ one attack was unilateral, and of such severity that the physician who was called in, knowing nothing of the previous history of the case, diagnosed renal colic. In Case XX. the child was admitted to the surgical wards supposed to have appendicitis. Fortunately the skin rash was noticed, the pain subsided, and he was transferred to the medical wards. The association of the colic with the passage of blood *per rectum* may, of course, lead to the diagnosis of intussusception. In the January number of the *British Journal of Children's Diseases*, vol. i., No. 1, Dr. G. A. Sutherland reports the case of a boy, aged five years, who, eight days before admission, had been seized with severe abdominal pain and vomiting. After continuing intermittently for four days the attack passed off, but recurred two days later in a more persistent manner. The day before admission the motions were blood-stained. The boy looked very ill; the abdomen was distended, and he had recurring attacks of severe colic. The temperature was normal. The next day the abdomen was more distended and palpation was impossible. It was decided that the symptoms indicated obstruction from intussusception. The abdomen was opened and the sigmoid flexure was found much distended; "on going over the small intestine a part of the bowel about five inches long was found, which was dark in color, evidently from extravasated blood, and with thickened walls." There were no other hemorrhages visible. The boy reacted well from the operation, and for the next five days he had only occasional pains. He then for the first time had a skin eruption, with albumin in the urine, and the diagnosis was cleared up.

In a second case reported by Dr. Sutherland, a girl, aged seven years, was admitted to hospital with Henoch's purpura. She had

¹ THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, January, 1904.

a prolonged illness with the usual attacks of abdominal pain, vomiting of blood, melaena, albuminuria, and hæmaturia. She gradually recovered, and three months later was readmitted with a recurrence of all the symptoms. The pain was more severe, referred to the umbilicus, spasmodic and colicky in character. There were hemorrhages similar to the previous attack. She died in a general convulsive seizure. The temperature was 104° F. There was acute general peritonitis and intussusception of the cæcum and part of the ileum into the colon. The involved portions of the intestine were black and hemorrhagic and gangrenous. As Dr. Sutherland rightly surmises, the fatal attack was induced by hemorrhage into the wall of the colon, leading to paralysis of the affected part and to increased muscular contraction, with colic, in the adjoining part of the bowel. As a result of these strong muscular contractions the sound part of the intestine became invaginated into the paralyzed and hemorrhagic portion.

In the same journal there is reported by Mr. Harold Burrows a case in which laparotomy was performed. A boy, aged eleven years, was admitted to the Bolingbroke Hospital July 6th with a diagnosis of obstruction from intussusception. After feeling out-of-sorts for ten days, on the morning of the sixth he was seized with violent pain in the abdomen and vomiting, and shortly afterward passed blood, the vomitus being dark brown, with a fecal odor. There was general tenderness of the abdomen; no distention; no lump. The abdominal muscles were held rigid. The patient was examined under an anæsthetic, and it was decided to operate. A few inches from the ileocæcal valve the ileum showed small petechial hemorrhages and some irregular patches of congestion. The peritoneum over these parts was sticky and had lost its gloss. On the following day the patient was free from pain, but it was then noticed that there was a skin eruption. From the history the boy had had on June 26th, eleven days before admission, some arthritis and a skin rash.

The following case, at present in my wards, is a further illustration of the surgical importance of this group of cases.

Lena F., aged seventeen years, admitted for the first time December 1, 1903. The patient was seen by Dr. McCrae in consultation with her attending physician. She was in bed, rolling about with the pain, and at times assumed very curious positions, getting in the knee-elbow position and crouching and bending, very rarely staying very long in any one place. The pain was evidently of great severity, paroxysmal in character. Examination of the abdomen was negative. There was no tenderness anywhere on pressure; no resistance. The knee-joints were slightly swollen and quite tender. There was no skin eruption; no fever. She had had large doses of morphine hypodermically, which only relieved the pain for a short time. The association of the arthritis made Dr. McCrae

suspicious of the form of abdominal colic associated with skin lesions and nephritis. She was removed to the hospital with some difficulty.

The history obtained was as follows:

She had been a healthy girl. The family history was excellent except that the mother was very neurotic. There was no rheumatism in the family. She had been very well as a child and had grown and thriven. Six months before admission she had her first attack of pain in the abdomen, which every week or two had recurred and had been very severe. The attack was usually associated with vomiting. It had no relation to food, never associated with jaundice; no chills. The bowels were obstinately constipated. The attacks recurred with great severity, and on August 3d an exploratory operation was made at the City Hospital—an incision in the upper part of the abdomen. The gall-bladder was found to be clear and there was no sign of gastric ulcer; no appendicitis. Three weeks after the operation the attacks recurred, and she has had a number of very severe paroxysms. On admission she was a healthy-looking, well-nourished girl. The abdomen was not distended; no special tension; palpation could be made readily in all regions and was negative. Examination of the thoracic organs was negative. The knee-joints were a little swollen and tender, not red. Examination of the gastric juice on two occasions showed nothing special. The stools were searched carefully without finding anything abnormal. For the first few days after admission she had attacks of pain lasting from one and a half to two minutes, colic-like in character, readily controlled with codeine. She vomited on December 1st. There was no special change in the leukocytes. The count on admission was normal; coagulation time three minutes. On December 5th she had slight bleeding from the nose. On the 6th there was a trace of albumin in the urine, which persisted, and toward the close of her stay in the hospital there were a few hyaline casts. There was no skin rash. The knee condition rapidly disappeared. She was discharged December 15th, very much improved.

She was readmitted January 28, 1904. She had been very much better, but she had had slight attacks. On January 25th the colic became very severe and she had much nausea. She had had recurring attacks of bleeding from the nose, and once, she said, bleeding from the gums. There had been no skin eruption. The knee-joints became swollen and painful shortly after admission. The leukocytes were 12,500. The urine on the 29th (catheterized specimen) was smoky, and contained albumin in small amount, a few red corpuscles, and numerous hyaline casts. She remained in the hospital for nine days; the pains lessened, and she improved in her general condition.

The practical lessons to be drawn from these three cases in which laparotomy was performed are: first, that in children with colic the

greatest care should be taken to get a full history, which may bring out the fact of previous attacks, either of skin lesions, of arthritis, or of intestinal crises; and secondly, to make the most careful inspection of the skin for angioneurotic œdema, purpura, or erythema. It is also to be borne in mind that recurring colic may be for many years the sole feature of this remarkable disease, as in Cases XVII. and XXVII. of my series, in which the obscurity of the attacks of colic was not cleared up until the final appearance of skin lesions. In the case here reported the intestinal crises, in combination with arthritis and the renal features, leave no doubt as to the diagnosis. In her next attack there may be purpura or angioneurotic œdema, or an acute nephritis may occur alone. The colic is the most constant of the visceral manifestations, occurring in twenty-five of the twenty-nine cases in my series. So far as I know, it is never dangerous. In no case recorded has death resulted, I believe, from intestinal causes. The examination in the cases of Dr. Sutherland and Mr. Barrows confirms the view that the colic is due to infiltration of the intestinal wall with blood and serum.

ANEURYSM OF THE ABDOMINAL AORTA

BY

WILLIAM OSLER, M.D., F.R.S.

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Reprinted from THE LANCET, October 14, 1905.

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ANEURYSM OF THE ABDOMINAL AORTA.¹

ANEURYSM of the abdominal aorta is very often diagnosed when not present, and when present the symptoms may be so obscure that the nature of the trouble is overlooked. I propose in this paper to speak of some aspects of our experience at the Johns Hopkins Hospital during the past 16 years, particularly with reference to the large abdominal tumour caused by the ruptured aneurysm. I have put in tabular form the cases, 16 in number, with the chief features. I have no intention of speaking of the history of the condition but I cannot refrain from two references. Vesalius was not only the first to recognise an aneurysm of the thoracic aorta during life but to him also we owe the first clinical description of aneurysm of the abdominal aorta. In the letter to Gasser acknowledging the receipt of the post-mortem report of a case of aneurysm of the thoracic aorta, which he had recognised two years before, he refers to an abdominal aneurysm in a woman who had had for many years a pulsating tumour below the stomach.² It is quite possible that this may have been only a throbbing aorta but it is evident that Vesalius had had his attention strongly directed to this disease, as he tells Gasser in the same letter that he had seen six cases of aneurysm since his consultation with him in Augsburg. 152 years later (1719) Valisneri (whose name is linked with the plant known to all young students of biology) made the diagnosis of aneurysm of the abdominal aorta in the case of a carman at Padua, aged about 30 years, who had had syphilis and over whose abdomen a wheel had passed. For eight months he was in bed with severe pains in the loins and back and after having been seen by several physicians Valisneri detected a pulsation and diagnosed aneurysm. The part afterwards swelled and the tumefaction extended and even raised the contiguous ribs. An unskilful surgeon opened the tumour; a copious effusion of blood followed and the man died in a quarter of an hour. Morgagni was present at the examination, when an aneurysm was found extending from the diaphragm to the pelvis, the organs were displaced to the right, and even the left kidney

¹ A paper read before the Medico-Chirurgical Society of Montreal.

² Roth's Vesalius.

was situated in the umbilical region. The sac contained a large quantity of lamellated concretions at the periphery and grumous blood in the centre. The ribs and the spine were eroded, the transverse processes and the bodies were nearly destroyed, whilst the thick intervertebral cartilages were all in their natural position, prominent and untouched by disease and beautifully whole. Here we have for the first time, I believe, a careful observation of the fact that the intervertebral discs resist the power of erosion—yielding, they do not feel the pressure.³ The case is of exceptional interest in connexion with some of those which I here report in which the diagnosis of tumour was made.

Incidence.—These 16 cases occurred among about 18,000 admissions to my wards. The ratio of abdominal to thoracic aneurysm was about 1 in 10. The incidence varies in different localities. In Vienna, in 19,300 necropsies there were only three cases among 222 cases of aneurysm (Schrötter). Of 468 cases of aneurysm at St. Bartholomew's Hospital, there were 23 of the abdominal aorta, 1 in 20 (Oswald Browne). J. H. Bryant's recent paper gives the Guy's Hospital figures for the years 1854–1900 inclusive as: 18,678 necropsies, 325 cases of aneurysm of the aorta, of which 54 were of the abdominal part of the vessel—16 per cent.⁴ Among the first 2200 necropsies at the Johns Hopkins Hospital there were 49 cases of aneurysm of the thoracic and 11 of the abdominal aorta.

Etiology.—Of the 16 cases, 14 were males and two were females. All statistics indicate the infrequency of the disease in women, a point to be borne in mind in diagnosis as the throbbing aorta is much more common in them. Nine of the patients were under 40 years of age. In three the disease had started before the thirtieth year. In two of Bryant's series the disease began before the twentieth year and 63 per cent. of the patients were under 40 years of age. Only seven of the patients had been very heavy workers. A definite history of syphilis was obtained in nine; in four others it was doubtful. Ten of the patients were alcoholics. Into the relationship of aneurysm to syphilis I cannot enter here. I believe it to be the all-important cause in persons under 40 years of age, and the more carefully we inquire into the history the larger the percentage of luetic cases. In 12 the aneurysm was saccular, in three rupture had occurred with the formation of a diffuse aneurysm, and one case was of the dissecting variety.

Symptoms.—In two patients the condition was latent and was found post mortem. Pain of a persistent, often of an agonising, character was present in 13 of the cases. It is

³ Morgagni: Section on Diseases of Aorta and other Vessels (Case 17).

⁴ Clinical Journal, 1903.

TABLE OF CASES OF ANEURYSM OF THE ABDOMINAL AORTA AT THE JOHNS HOPKINS HOSPITAL, BALTIMORE, U.S.A.

No.	Sex.	Age (years).	Syphilis.	Alcohol.	Hard work.	Chief symptoms.	Physical signs.	Operation.	Remarks.
1	M.	69	No.	No.	Yes.	Pain, nausea, and vomiting.	Tumour; thrill; no murmur.	Exploratory laparotomy.	Tumour had lasted 3 years; remarkable mobility.
2	F.	36 ²	?	?	No.	Pain and emaciation.	Enormous non pulsatile tumour.	Exploratory aspiration.	Huge diffuse aneurysm.
3	M.	33	?	No.	..	Pain; loss of weight.	Enormous pulsating tumour in flank.	Incision; attempt to compress abdominal aorta.	Death on the table; enormous diffuse aneurysm.
4	M.	47	Yes.	Yes.	Yes.	Pain of extraordinary persistency and violence.	Pulsation in back; thrill; systolic murmur.	—	Duration 3½ years.
5	M.	27	..	..	No.	Pain.	Tumour; thrill; systolic and diastolic murmurs.	Wiring and electrolysis.	Death in 48 hours; rupture through the diaphragm.
6	M.	36	..	..	..	..	Tumour; systolic murmur; pulsation behind.	—	—
7	M.	68	..	..	Yes.	No symptoms.	Large tumour; systolic murmur.	—	—
8	M.	36	..	..	No.	Great pain.	Tumour; systolic bruit.	Wiring and electrolysis.	Death on ninth day; rupture into peritoneum.
9	F.	33	?	?	Yes.	Pain.	Large tumour; systolic and diastolic bruits.	—	—
10	M.	53	Yes.	No.	No.	No pain.	Large tumour; systolic and diastolic murmurs.	Wiring and electrolysis.	Discharged in 4 weeks. No change.
11	M.	38	..	Yes.	..	Pains.	Heaving tumour; systolic bruit.	..	Death on fourteenth day; rupture of sac.
12	M.	43	No.	..	..	Pain.	Tumour; thrill; systolic murmur.	..	Pulsation much diminished; discharged in 4 weeks; no subsequent note.
13	M.	30	Yes.	No.	..	Pain; vomiting.	Tumour; thrill; systolic murmur.	..	Great improvement; lived 3½ years.
14	M.	31	..	Yes.	Yes.	No abdominal symptoms.	—	—	Dissecting aneurysm of entire abdominal aorta.
15	M.	54	No.	..	..	Latent.	Death from pneumonia.	—	Aneurysm (sacculated) of abdominal aorta; found post mortem.
16	M.	49	..	..	..	Pain.	Large pulsating tumour; rupture.	Wiring and electrolysis.	Rupture; diffuse aneurysm; death 6 months later.

usually the first indication of the trouble and throughout remains *the* feature, reaching an intensity not met with in any other disease. Five of the patients were taking large doses of morphine before admission. Associated with pressure upon, or stretching of, the nerves it is of a constant, dull, boring character, varied in some cases with paroxysms of frightful severity. Erosion of the vertebræ is usually associated with intense pain, but not always, as there may be extensive destruction without much pain but as a rule there is severe aching, boring pain which, when the nerve roots are involved, may radiate in their course. And lastly, the pain may be due to rupture of the sac and the passage of the blood into the retroperitoneal and muscular tissue. It may simulate the pain of gall-stones, of renal colic, or of appendicitis and pressure on the nerves may cause pain in the testicles and in the course of the anterior crural or sciatic nerves. The recumbent posture may be impossible during the paroxysms. Pressure usually gives slight relief. Stokes, whose description of aneurysm of the abdominal aorta remains unrivalled, recognised the remarkable characters of the pain—the dull, boring, steady form and the awful paroxysms. Beatty's classical case, which he quotes in full, first called the attention of physicians to these special features of the disease. It is interesting to note that Andral regarded Beatty's case as a rare form of intestinal neurosis.

Nausea and vomiting were early and severe symptoms in two cases. Hæmatemesis did not occur in any cases of the series. Constipation was a common feature. Intermittent claudication occurred in one case. Altogether, apart from pain and the features associated with rupture of the sac, there were not many symptoms and the patients were usually well nourished and healthy-looking. Hæmorrhage from the bowels occurred in Case 16 after operation. As the patient lived for six months, and as the necropsy showed, it could not come from erosion of the bowel. I have reported one case—a patient under the care of Dr. Palmer Howard—in which, in a robust, strong man who had had intense backache, death occurred suddenly from rupture into the duodenum. Pressure on this part may lead to great dilatation of the stomach. I saw with Dr. F. J. Shepherd an elderly lady with great distension of the abdomen, dilatation of the stomach, with severe pain and anæmia. The necropsy showed an enormously dilated stomach due to pressure of an aneurysm on the duodenum. While revising this paper Professor James Ritchie showed me an aneurysm of the aorta just as it passed through the diaphragm which had compressed the cardiac end of the stomach causing great dilatation of the œsophagus.

Diagnosis.—The obscurity of the symptoms in aneurysm of the abdominal aorta has been recognised by all observers. It is well illustrated in the Guy's Hospital statistics. "A

correct conclusion during life as to the nature of the disease was arrived at in 18 only out of the 54 cases on which this lecture is based, an analysis showing that an abdominal tumour was detected in 31, pulsation in 35, expansile pulsation in eight only, and a systolic murmur in 26. Incorrect diagnoses of a variety of diseases were made, including malignant tumours lying in front of the aorta, renal calculus, lead colic, spinal caries, sarcoma of the kidney, nephritis, perinephritis, pneumothorax, pleuritic effusion, epithelioma of the oesophagus, malingering, chronic intestinal obstruction, &c."⁵

As pulsation or throbbing, evident to the eye of the observer, or felt by the patient, is the most obvious feature of the disease, it will be well to consider briefly in what circumstances pulsation occurs in the abdomen. Normally, as one looks at the abdomen of a person in the recumbent posture, pulsation is visible between the ensiform cartilage and the navel. It may be slight, even absent, but in a majority of individuals it is present and in spare subjects in two special areas, an upper, at the ensiform cartilage or in the right costo-xiphoid angle, and a lower, just above and a little to the left of the navel. These may be separated by an area in which no pulsation is visible but they are often continuous. In favourable subjects one can see that the upper pulsation precedes the lower by an appreciable period of time. After running 100 yards quickly the chief impulse is at the ensiform cartilage, representing the throbbing of the dilated right chambers which are close to it. In over-distension of these chambers, particularly in the hypertrophy and dilatation of valvular disease, the beating in what we call the pit of the stomach is very evident and may be associated with a subjective sensation very distressing to the patient. The actual impulse itself is rarely cardiac but is due to the pushing down and out of the left lobe of the liver.

Sometimes the pulsation is actually cardiac, due to the protrusion of the abdominal wall by the right ventricle. This may occur in great dilatation, as Morgagni observed.⁶ The diaphragm may be pushed down and at each impulse of the heart the ensiform cartilage and the skin below it are pushed out so forcibly that the condition is mistaken for aneurysm of the upper abdominal aorta. I have seen in disease of the mitral valve the dilated right ventricle cause a large pulsating tumour below the ensiform cartilage. In one patient at Mount Sinai Hospital, seen with one of the house physicians, a woman with mitral stenosis and enormous hypertrophy and dilatation of the right heart, the question was raised as to the existence of an aneurysm of the heart. In another instance in a boy, aged five years, seen on April 18th, 1895, with an extreme degree of mitral disease

⁵ Bryant: Clinical Journal, 1903.

⁶ Seventeenth letter, twenty-eighth article.

and great hypertrophy of the heart, the note is worth quoting: "Apex beat is in sixth and seventh interspaces, forcible, widespread, and extends laterally to the mid-axillary line. The præcordial bulging is marked, and below the left costal margin, projecting for 4 cm. and occupying *the whole of the left quadrant of the epigastric region*, is a prominent heaving, pulsating projection of remarkable dimensions. During coughing it becomes very much larger. In this there is a very loud systolic murmur and a rumbling murmur in diastole." It was perfectly evident that this projecting tumour was only part of an enormously distended right ventricle, not an aneurysmal tumour, as the impulse was synchronous with the apex beat and was directly continuous with the wide-spread throbbing of the heart. The cardiac epigastric tumour may be central and of a remarkable prominence. The beating of the aorta is most evident when the vessel becomes more exposed in the lower half of the epigastric and in the upper umbilical areas. In well-nourished persons the pulsation is slight and the vessel cannot be easily felt. In enteroptosis and great emaciation the vessel may be rolled under the finger as a distinct tube, feeling of about the size of the index finger, and may even be readily grasped. In rare instances the vessel is seen; even the bifurcation may be visible. In a patient with extreme anorexia nervosa the vessel with its bifurcation showed in a photograph.

Abnormal aortic pulsation is met with under the following conditions. First, in neurotic and hysterical states, chiefly in women. I suppose there is no young physician who has not diagnosed as aneurysm of the aorta the preternatural pulsation of the vessel, as Allan Burns calls it. In any suspected case it is well to be sceptical, particularly in women, in whom aneurysm is excessively rare. The subjects of this remarkable pulsation are usually neurotic, sometimes definitely hysterical. They complain of pain in the back and at the occiput and have the usual symptoms of nervous exhaustion and debility, but the special feature upon which all their feelings centre is the throbbing in the abdomen, which may be so severe as to interfere with their sleeping or even with the taking of food. In extreme cases there are pain, shortness of breath, and even remarkable attacks of hæmatemesis. It is stated that Hippocrates had noticed this pulsation, but to Morgagni we owe the first accurate description. Allan Burns⁷ gives a very careful account of the condition and quotes from Albers, of Bremen, a remarkable instance in which, associated with the throbbing, there was passage of dark blood in the stools. The association of small hæmorrhages from the stomach and intestines has been described by Sidney Phillips⁸ but I have seen no reported case more remark-

⁷ Observations on Diseases of the Heart, &c., 1809.

⁸ Brit. Med. Jour., 1887, vol. ii.

able than that of Albers. The girl was excessively neurotic, had fainting fits, great palpitation in the abdomen, and an astonishing degree of violent pulsation. She had passage of blood from the bowels and the diagnosis of aneurysm was made, but a Dr. Weinhalt, who was called in, said he doubted if the pulsations proceeded from aneurysm as he had read of similar cases in Morgagni. The points to be borne in mind in these cases are : (1) That the pulsation occurs in nervous or hysterical women or in neurotic or hypochondriacal males. In mild forms it is common. (2) The subjective sensations may be pronounced—pain, abdominal distress, nausea, sickness, constipation, and, in some instances, the vomiting of small quantities of blood and the passage of blood in the stools. (3) The degree of visible and palpable pulsation may be extreme. The abdominal aorta is easily palpable and may be grasped in the fingers. It is sometimes tender. No definite tumour is felt. With much anæmia a thrill may be present. A soft systolic bruit may be heard, even without any pressure of the stethoscope. A mistake is not likely to occur if it is remembered that no pulsation, however forcible, no thrill, however intense, no bruit, however loud—singly or together—justify the diagnosis of an aneurysm of the abdominal aorta, *only the presence of a palpable, expansile tumour.*

Secondly, preternatural pulsation in the upper portion of the abdomen may be associated with tumours. In cancer of the stomach it is quite common to see a diffuse impulse in the left half of the epigastric or in the upper quadrant of the umbilical region. In the large, flat carcinoma of the stomach the impulse may be very forcible, but it is not expansile, and there is rarely any difficulty in determining that it is not aneurysmal. Cysts and solid tumours of the pancreas, cysts and tumours of the mesentery, and solid tumours of the retroperitoneal glands may be associated with a widespread impulse in the upper part of the abdomen. The greatest difficulty is encountered in comparatively small tumours directly over the course of the vessel, as in thin persons the throbbing may be so pronounced that, with a thrill and bruit, often present, the resemblance to aneurysm may be very close. As Allan Burns remarks, a tumour placed over the course of an artery and attached to it pulsates more strongly than the vessel itself. It can usually be noted in thin subjects that there is no actual expansile pulsation in the tumour itself.

Thirdly, in anæmia. In extreme anæmia there is throbbing of the arteries, both visible and palpable, and the pulse may even have the Corrigan or “water-hammer” quality. The most extreme throbbing may be seen and felt in the abdominal aorta, and it is not infrequently a source of great distress to the patient. The impulse may be bounding, striking the hand with extraordinary force, and when associated with a thrill and a bruit it may suggest aneurysm very

strongly. I have reported a case in point.⁹ On June 13th, 1885, I saw with Dr. Whiteside a large, stout man, aged 45 years, who had had for some months dyspepsia and pains in the abdomen of exceptional severity. He was anæmic and sweating and looked as though he had had a hæmorrhage. The large and fat abdomen throbbed in a most extraordinary way. The maximum impulse was a little below the ensiform cartilage, but from this point a large wave of pulsation passed over the whole abdomen. The shock was communicated to the patient's body and one could see the jar in the head and in the feet. Standing against the foot of the bed I could feel distinctly the impulse jarring the entire bed. On palpation the throbbing was violent with each systole, but it was trifling in comparison with the extent of visible pulsation. There was no expansile movement. No tumour could be felt. A systolic murmur was audible. That evening shortly after my visit the cause of the sudden anæmia became evident, as he passed a large amount of blood by the bowel and vomited blood. In the morning and for the next three or four days he vomited and passed large quantities of blood per rectum. The necropsy showed a duodenal ulcer lying directly upon the pancreas and the aorta, with thickening about it. The aorta itself was perfectly normal.

Fourthly, as pointed out by Stokes, the aorta may throb so forcibly in aortic insufficiency that aneurysm is suspected. It is a good rule never to diagnose aneurysm of any part of the aorta in young persons, particularly if anæmic, with insufficient aortic valves. Pulsation of extraordinary force, thrill, and bruit may all be present in an abdominal aorta which, post mortem, shows neither dilatation nor disease.

In old men with thin abdominal walls a very sclerotic aorta may suggest aneurysm. Among other causes of abdominal pulsation may be mentioned regurgitation of blood along the inferior vena cava. Allan Burns refers to a case of this kind, described by Senac, in which the vena cava was as large as the arm and the patient had a very violent pulsation in the epigastrium. I have not been able to find the original report.

In the diagnosis of aneurysm of the abdominal aorta perhaps the greatest difficulty arises when the sac has ruptured behind the peritoneum with the gradual formation of a large tumour, filling the upper part of the abdomen, or one or both flanks, and in which there may be little or no pulsation. While attention was called to this circumstance years ago by Stokes, that it warrants more careful consideration is shown by the frequency with which the condition is overlooked, and the extreme gravity of an operation upon what is supposed to be some form of new growth. Among the Guy's Hospital series Dr. J. H. Bryant gives cases in

⁹ Canada Medical and Surgical Journal, March, 1887.

which the ruptured aneurysm was mistaken for renal calculus (owing to the agonising pain extending down in the left groin and to the testis), renal sarcoma (operated upon), cancer of the œsophagus, lead colic, and malignant disease of the liver.

There is perhaps no more tragic event in operative surgery than unwittingly to open an aneurysm. It has been done by past-masters of the craft. Pirogoff's comment on such a case has always appealed to me very strongly: "There are in everyone's practice moments in which his vision is holden so that even an experienced man cannot see what is nevertheless perfectly clear. At least, I have noticed this in my own case. An overweening self-confidence, a preconceived opinion, vanity, and weariness are the causes of these astounding mistakes."

Nowadays when laparotomy is so common this form of aneurysm in the abdomen has been operated upon not infrequently. The suddenness of the onset of the pain and its great severity and the absence of pulsation in the tumour are very apt to lead one astray. In Case 2 in which there was an exploratory aspiration we had no idea that it was an aneurysm. I have not looked specially into the literature of the subject but I have had my attention called to several cases. Dr. Williams of Buffalo showed me two specimens, both from patients operated on for abdominal tumour without any idea of the presence of aneurysm. Lockett¹⁰ of Jamaica operated on a large abdominal tumour supposed to be associated with the liver but he found a large non-pulsating aneurysm of the abdominal aorta. While revising this paper for the press a man was admitted to the Radcliffe Infirmary under the care of Dr. E. C. Bevers with great pain and swelling in the right iliac fossa. He had been in one of the London hospitals with renal colic. An operation for suspected appendicitis revealed the presence of a large retro-peritoneal blood tumour which followed rupture of an abdominal aneurysm.

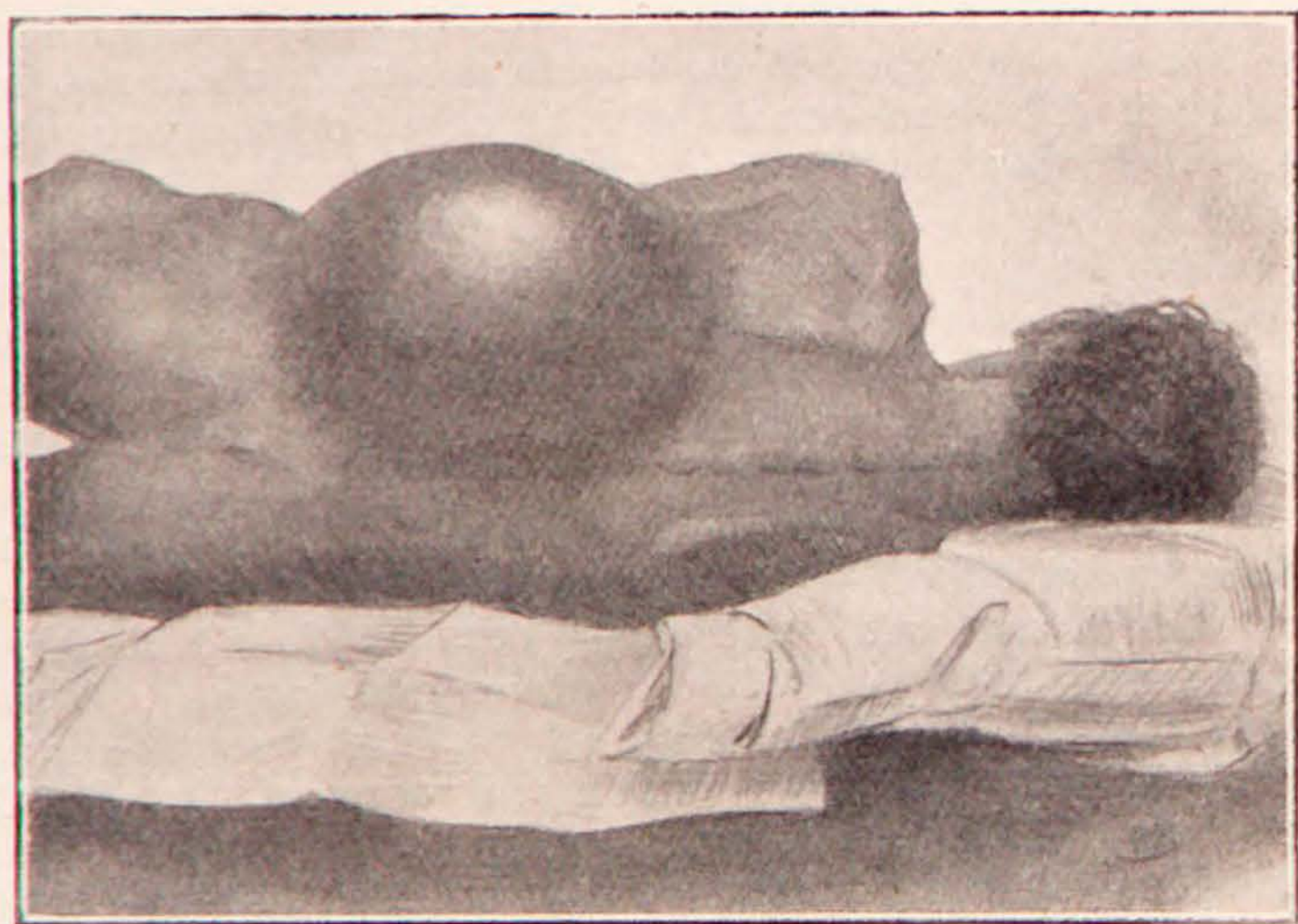
As the three cases in my series illustrate many important points in this form of the disease I shall report them in full.

CASE 2. Pain in the back for nearly a year; admitted with an enormous abdominal tumour, projecting at the back and flank; no pulsation; thrill and rasping murmur in the epigastrium; extreme emaciation; rapidly growing sarcoma suspected; aspiration; necropsy; large diffuse aneurysm. (Figs. 1 and 2.)—The patient, a coloured woman, aged about 36 years, was admitted on Sept. 10th, 1894. She had been married eight years, had had four children, two still-born. Her present illness began in October, 1893, with pain in the small of the back. About February, 1894, she noticed a rounded swelling like a small knob on one of the lower ribs.

¹⁰ Brit. Med. Jour 1901, vol. ii.

It was immediately under the skin but she could not say whether it was on a rib or between two ribs. In April, 1894, she went to the Pennsylvania Hospital and was confined to bed until August. For the past three weeks the tumour had grown with great rapidity. The chief trouble appeared to have been pain, which at first was continuous and later had been what she called "a jumping ache." She had had to take much morphine for the pain. The patient was extremely emaciated. The most striking feature was a very large tumour on the left side of the abdomen, causing great bulging in the flank and back. The drawing made by Max Broedel (Fig. 1) illustrates better than any description the

FIG. 1.

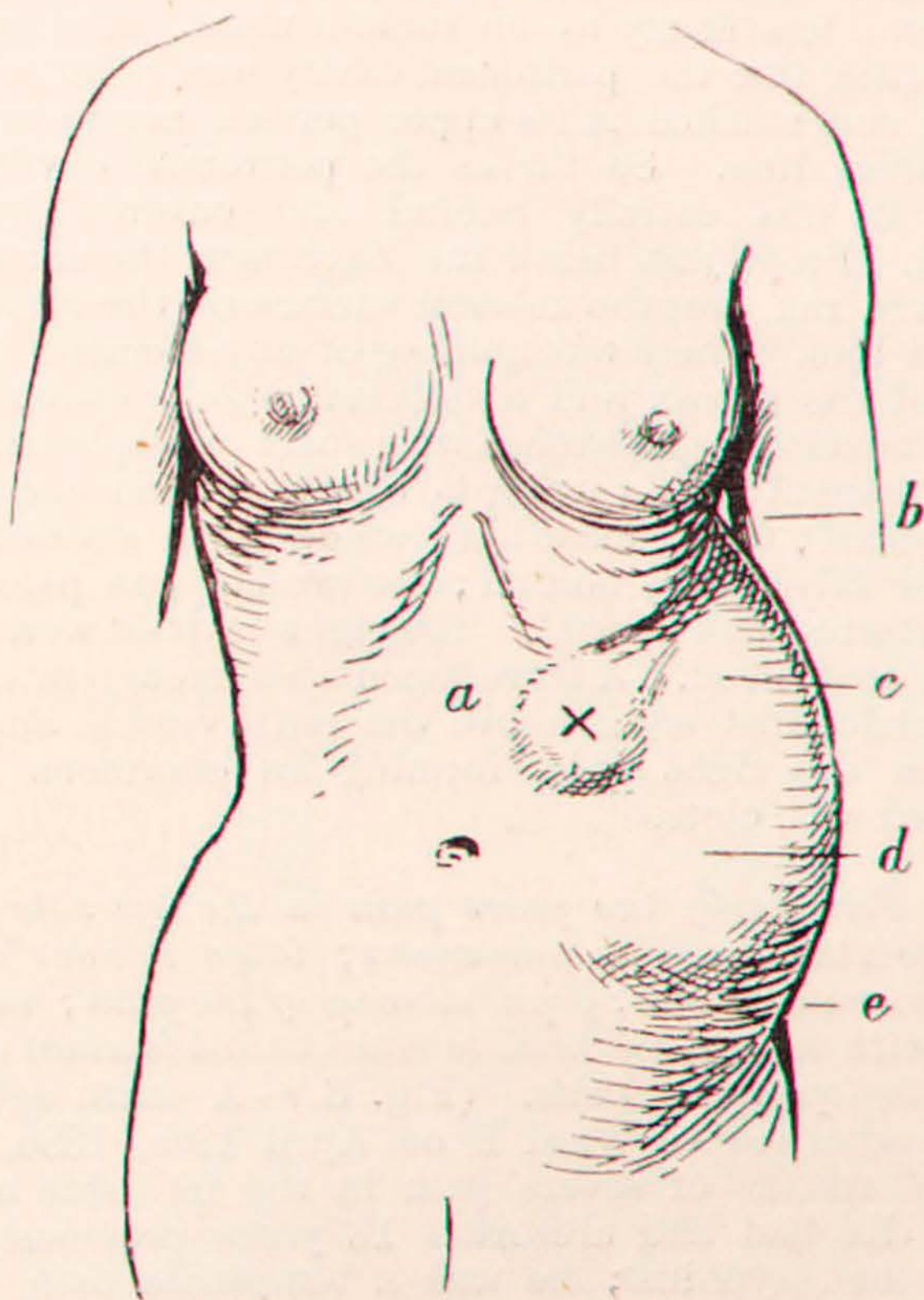


Appearance of the diffuse aneurysm in Case 2, seen from behind.

remarkable appearance presented by this mass. There was *no pulsation* but in the epigastrium there were a loud thrill and a very rasping murmur. A suggestive feature was that the heart sounds were transmitted to the large tumour just below the costal border. It seemed everywhere firm and resistant, though midway between the costal border and the crest of the ilium there were several softer spots to be felt. The skin over the mass was very glistening, not hæmorrhagic. As the nature of the tumour was quite doubtful, on Sept. 15th she was given ether and Dr. Halsted made an exploratory aspiration. A thin blood-coloured fluid was drawn off and the needle seemed to enter a large cavity. A few days later oozing began from the point of puncture and there was a central spot of softening, which gradually enlarged and discharged a very offensive material. The patient died from exhaustion on Oct. 1st.

Necropsy.—At the post-mortem examination the body was 150 centimetres long; there was no œdema. The abdomen was swollen. On the left side, extending from the crest of the ilium to within five centimetres of the axilla and occupying the entire thickness of the lateral aspect of the body, was a tumour mass of rather soft consistence. The epidermis over the tumour was peeling off and in the centre

FIG. 2.



Front view of Case 2. *a*, Marks the site of a loud rasping systolic murmur. *b*, Level of the ninth rib. *c*, A large, rounded, glistening mass; very firm area under the ribs. *d*, Soft spots to be felt in this region. *e*, Level of crest of ilium. *x*, A small mass which appears to be separated from the larger mass.

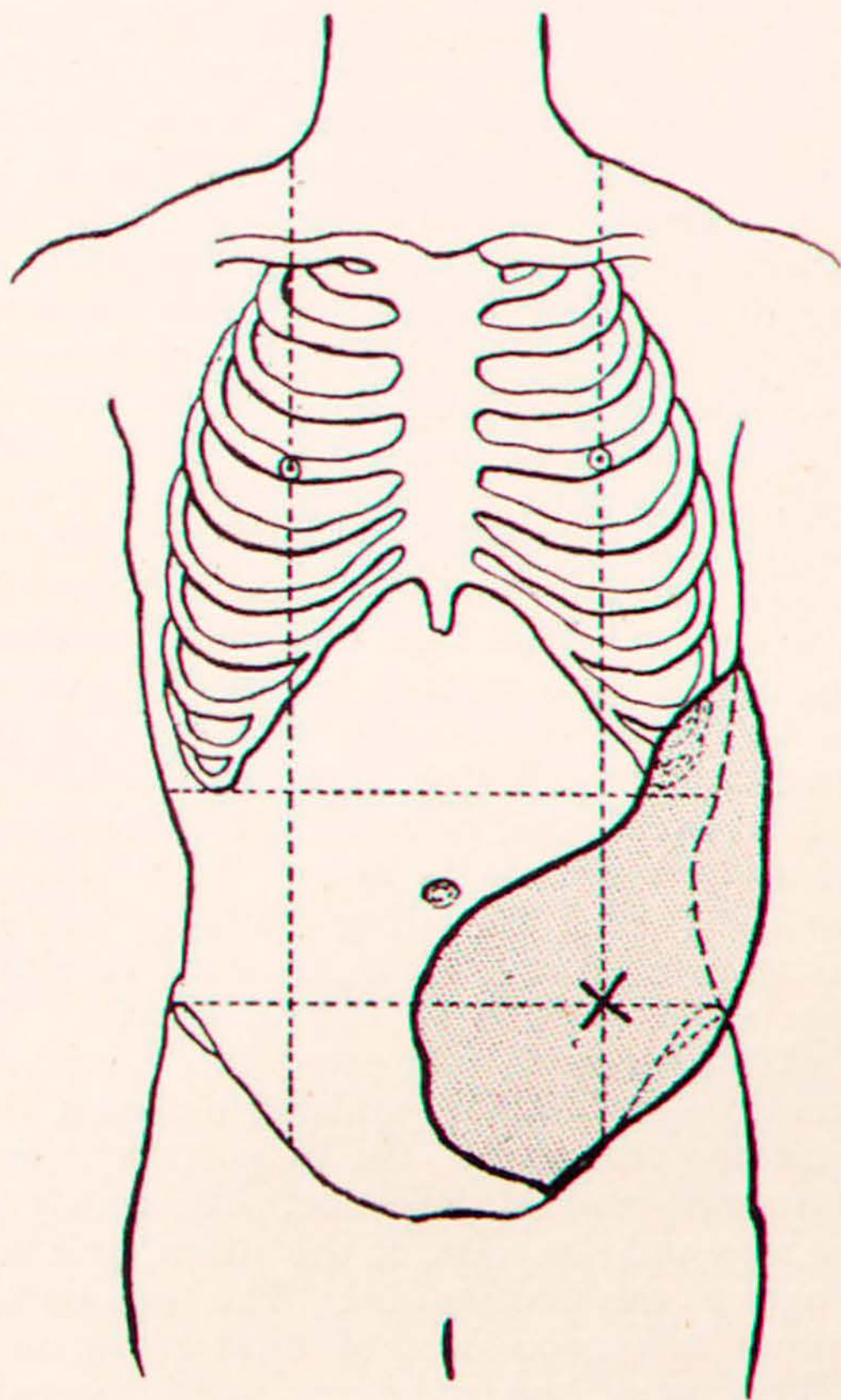
there was a slight defect from which blood-stained serum might be pressed. The orifice of this defect did not exceed two millimetres in diameter. The whole tumour bulged outwards and had a convex surface, the apex of the convexity being at the point of skin defect. The surface tapered towards the ilium on the one side and towards the axilla on the other. The subcutaneous fat was almost absent; the muscles were very thin. There was no excess of

fluid in the peritoneum. Bulging into the peritoneal cavity on the left side was a continuation of the tumour seen externally. It had displaced the left kidney and spleen, which occupied its superior surface—the kidney below, the spleen still covered by the diaphragm. The kidney could be separated and formed no essential part of the tumour mass. It was somewhat flattened on the side next the tumour. The ureter was of normal size. The spleen was bound to the diaphragm by old strong adhesions and by similar adhesions to the left lobe of the liver and less firmly to the tumour mass. The tumour mass projecting into the peritoneal cavity was as large as an adult head and reached in its upper portion nearly or quite to the median line. So far as the peritoneal cavity was concerned it was entirely behind and covered by the peritoneum. From just below the diaphragm the aorta was lifted up and ran over the anterior surface of the tumour in the median line. There was nothing of any moment in the condition of the thorax and abdominal organs except that there were numerous gall-stones with some peri-splenitis and slight peri-hepatitis. As regards the heart and aorta the heart was small; the endocardium was slightly stained with bile; all the valves were normal; the muscle was pale; the coronary arteries were normal. The right cavities were filled with coagulated blood. A large sacculated aneurysm sprang from the abdominal aorta above the renal vessels and had ruptured on the right side, forming an enormous blood tumour filled with clots.

CASE 3. For nearly two years pain in the left side of the abdomen, constant, and in paroxysms; large tumour in the left flank, increase in size; great increase of the pain; incision of tumour with an attempt made to reach the abdominal aorta; death on the operating table. (Fig. 3.)—A man, aged 33 years, was admitted to Ward E on April 13th, 1896, complaining of attacks of severe pain in the left side of the abdomen. He had had urethritis 12 years previously; he had never had syphilis; he was a temperate man. Two years ago he had attacks of palpitation of the heart and for nearly six months had some dizziness. His present illness he dated from 20 months previously, when he had first a sharp, stabbing pain in the left side of the abdomen. It was always in the same spot in the flank and came on about the same time in the day, and lasted from two to 12 hours. At first it was not very severe but at times for three or four days he would have attacks in which it was bad enough to cause him to double up with the pain. Evidently the pain had been of very great severity and had been the most constant feature in the case. The attacks would come on at any hour of the day or night. The pain started in the left side and radiated upwards and downwards towards the testicle. He described it as cutting in character and said that it was like the pain of a

boil. During a severe attack his legs were drawn up and he obtained relief by pressure on the left side of the abdomen. It was sometimes so bad that he had had nausea with it but never any vomiting. The pain was referred chiefly to the back rather than to the front and he said that he had always been more tender on pressure in the lumbar region than in the front part of the abdomen. He had very frequently had to take morphine for the severity of the pain and during the past year he thought that he had lost as much as 25 or 30

FIG. 3.



Outline of the tumour in Case 3.

pounds in weight. He had never had any blood in the urine nor had he passed any gravel. The patient was a well-built, well-nourished man, rather pale, but the mucous membranes were of good colour; the pulse was 30; examination of the thoracic organs was negative. The apex beat was visible in the fourth and fifth interspace, in and a little outside the nipple. The maximum impulse was inside the nipple line. The sounds were clear at both the apex and the base; there

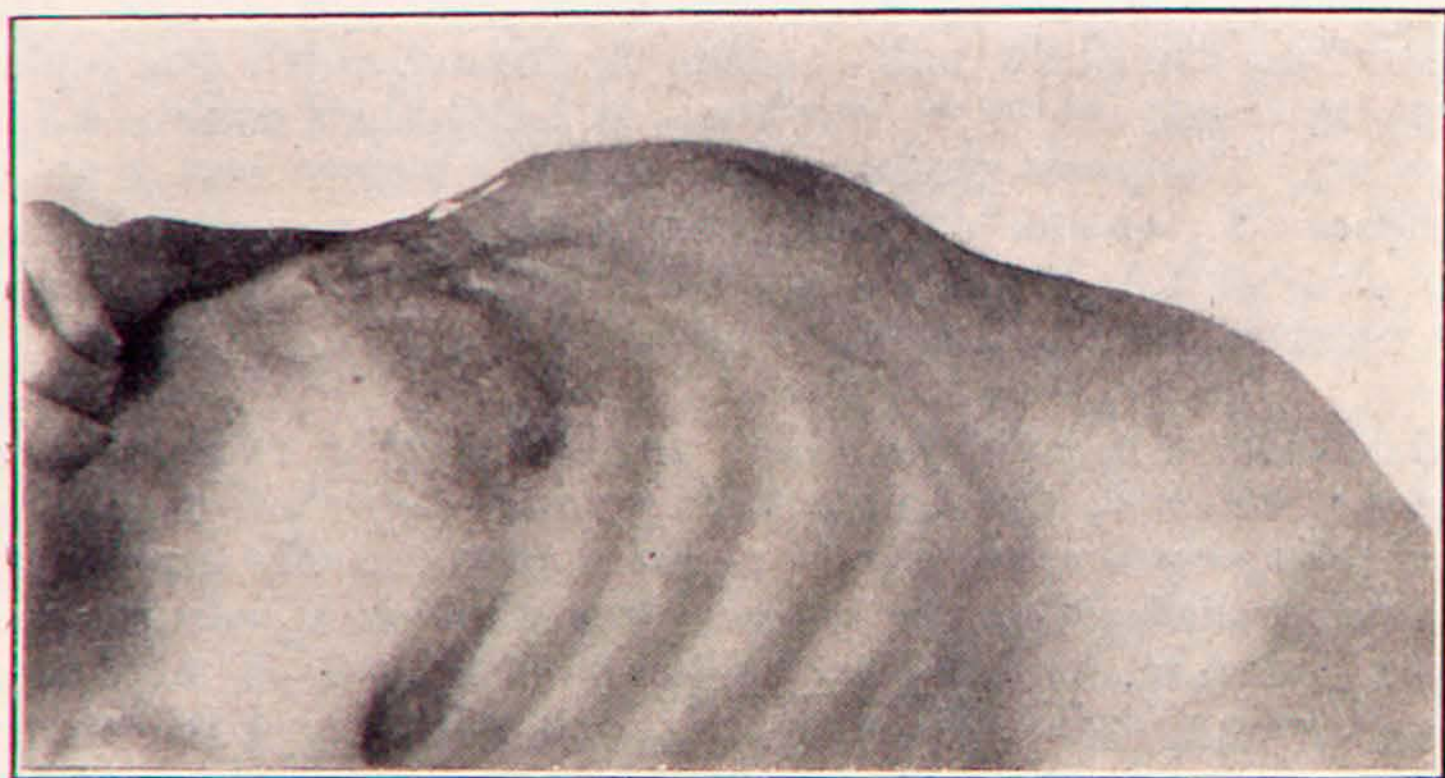
was no accentuation of the aortic second sound. The abdomen was symmetrical, tympanitic; the skin of the left side was pigmented from the application of plasters, &c. The recti were held very tense. Pressure behind in the lumbar region caused a good deal of pain. On bimanual palpation in the left flank there was felt on deep inspiration what was thought to be the left kidney. Pressure caused a good deal of pain. There were no enlarged glands in the groin. There was marked sclerosis of the veins of the right leg. The testicles and epididymides were normal. This note was made by Dr. Harold Parsons the day after admission. The urine was amber-coloured; it was of specific gravity 1024 and contained no albumin or tube casts. On April 19th Dr. Thayer noticed that there was a resistant mass which could be taken between the hands in the left renal region, very tender on pressure. The abdominal muscles were, however, so rigid that thorough examination was not possible. Early on the morning of the 20th the patient was awakened with a very intense pain in the left side of such severity that he required morphine hypodermically. At the time of the visit the muscular resistance on the left side of the abdomen was very marked. The patient complained of great pain on pressure in front and more particularly behind. On deep inspiration nothing could be seen and on palpation nothing more definite was to be felt than was noted on the 19th. On the 22nd, at 5 P.M., the patient began to have very severe pain in the left side, similar, he said, to the pain of his ordinary attacks but much more intense than he had ever had before. At 5.30 Dr. Thayer dictated the following note: "In left side of abdomen there is now a large tumour occupying the entire flank, extending to the umbilicus and reaching almost to Poupart's ligament. It emerges from beneath the costal margin at the ninth rib. The normal depression of the flank is converted into a convexity. The greatest prominence is about midway between the anterior superior spine and the navel. On inspection it is seen that this presents a well-marked pulsation, particularly in the flank between the ribs and the crest of the ilium, and to a less extent as far over as the middle line. The tumour is uniformly dull, and there is a good deal of tenderness on pressure." (Fig. 3.) The mass had a boggy, semi-fluctuating feel—particularly at X in the figure. The patient found a good deal of relief by having the left leg drawn up, and there was some pain down the back of the leg, particularly when extended. Rectal examination was negative. The face looked blanched; the pulse was 120. The red blood corpuscles were about 3,000,000 per cubic millimetre; the leucocytes under 5000 per cubic millimetre. A needle inserted into the most prominent part of the mass obtained only a few drops of blood. On April 23rd the patient had had a fairly comfortable night. Dr. Thayer noted that the patient's complexion had become more sallow and had a slightly yellowish tinge. The tumour

on the left side was not quite so prominent. The pulsation in the upper part was, however, more marked, and at the point of maximum pulsation there was a single shock heard but no murmur. There was a very suspicious fluctuation in the mass, the outlines of which remained very much the same as the day before. When the patient turned on his right side the expansile character of the pulsation was very evident. The recurring attacks of pain, the progressive loss of weight, and the appearance of a tumour in the flank were suggestive of new growth, and it was thought possible that the pulsation might be due to extreme vascularity. The other possibility was an aneurysm of one of the branches of the abdominal aorta, or of the aorta itself, and this view was favoured by the rapid appearance of the growth and the marked impulse. The patient's condition became desperate and he urged that something should be done. Dr. Halsted determined to try to reach the abdominal aorta. Accordingly the tumour was fully exposed by median incision and was found to be an immense retroperitoneal blood cyst occupying the left half of the abdomen, with the colon passing along its right margin. A large mass could be felt high up. The aorta was exposed and an attempt was made to compress it. As the large clots turned out they were followed in a moment or two by a gush of bright arterial blood and the patient died instantly.

CASE 16. *Pain in the side; formation of a tumour; sac wired; melæna, three attacks; gradual improvement; four months later severe pain with rapid increase in the size of the tumour, which filled the entire left side; death from exhaustion; necropsy, huge diffuse aneurysm (Fig. 4).*—The patient was a man, aged 49 years, by occupation a bar tender. He was first admitted on March 23rd, 1899, with acute lobar pneumonia. At that time he denied ever having had syphilis. The course was uneventful and he made a complete recovery. There was nothing to indicate an aneurysm; he complained of no pain; no mass was felt in the abdomen. The involvement was of his left lower lobe and there occurred a slight pleural effusion, straw-coloured fluid being withdrawn by the aspirating needle. The patient was readmitted on April 16th, 1904. Since the previous admission he had been a cook; he had had to lift heavy pots and kettles and had been exposed to rapid changes of temperature. He had been in the habit of drinking one bottle of beer daily but no whisky or gin. On the previous admission, however, he acknowledged having been a pretty heavy drinker as a young man. He again denied syphilis; no history was to be obtained of secondary symptoms. The onset of the present illness occurred six months previously with pain in the left flank, constant, dull, and aching in character. The pain was relieved by pressing the epigastrium against the corner of the table. Ten weeks previously he was admitted to St. Joseph's Hos-

pital where a diagnosis of aneurysm was made. At this time he had pain in the left testicle and adjacent portions of the thigh. The pain was increased by lying on the left side and also by over-eating. The appetite had been good and except for the symptoms mentioned there had been no distress; there was no loss of weight. On admission the heart was slightly enlarged; the second aortic sound was markedly accentuated and ringing. The arteries, brachials and radials, were definitely felt, but not markedly sclerosed. The temporals could not be felt. On April 19th the following note was made: "Healthy-looking, fairly robust man. Arteries are a little thickened. He looks as if he had lost a little weight. Pulsation in upper abdomen and left hypochondrium; maximum at junction. Pulsation a little more to left than to right. Cardiac pulsation corre-

FIG. 4.



Reproduced from a photograph of the tumour in Case 16. The aneurysm has lifted the left costal arch and fills the whole of the left side of the abdomen.

sponds closely with abdominal pulsation; abdominal pulsation a trifle behind cardiac pulsation. No difference between infracostal grooves. Pulsation and shock reached to, but did not lift, the ensiform. The pulsation was seen as far as navel. Lessened on deep breathing. No pulsation in back. Palpation; forcible pulsation with the hand on epigastrium; maximum about the centre. No thrill. No marked tenderness. As the fingers pass deeply in there is a very positive expansile pulsation; more marked to the left; felt 2·5 inches from median line. Tumour mass is definitely felt, particularly to left, as far as nipple line; large, rounded, cannot be felt to same extent to right; can be felt below, where there is a very definite thrill. Short, rough systolic murmur heard everywhere over the tumour; maximum just about the centre; diminishes in intensity

toward ensiform; heard at the back. Heard much more loudly to the left. Aortic second sound ringing. No tumour in flank itself; one can pass hand deeply into renal region. Femorals are both pulsating." On the 22nd the blood pressure in the dorsalis pedis arteries was—right 210 millimetres, left 200 millimetres. On the 29th the aneurysm was wired by Dr. Finney. An incision was made at the border of the left rectus; the sac was exposed with considerable difficulty. On palpation the sac was found to have a rather wide base. 11 feet of silver wire were inserted; a current of ten milliamperes was passed for 15 minutes. The incision was closed. Some pain was present after the operation, principally in the distribution of the ilio-inguinal nerve. On May 2nd the pain was more severe. On the 5th hæmorrhage from the bowels of about 100 cubic centimetres of clotted blood took place. There was no change otherwise. Some vomiting occurred during the next few days but no blood. The first dressing was done on May 9th. The wound was healed perfectly; pulsation was apparently more marked than before the operation; the tumour mass was more prominent. A well-marked thrill and bruit could be heard over it. On the 27th a second intestinal hæmorrhage took place. The patient was having much pain and at times was irrational. On the 28th there was a third hæmorrhage of 150 cubic centimetres. On June 24th it was noted that the patient was doing well; he was a good colour. The tumour seemed less prominent and felt very hard. The spleen was pushed over to the left. A systolic bruit could be heard to the right of the line of incision but not to the left. Behind there was a very marked pulsation. There was a little bulging in the lumbar region. Pulsation was visible at and beneath the eleventh rib; pulsation was also felt. On August 21st the patient had more pain than usual. He slept with morphine but on the following morning his face appeared rather blanched; there was some fulness in the left flank which was extremely tender. Pulsation of the aneurysm was less than on the previous day. On the 23rd it was noted that below the sixth interspace in the mid-axilla, throughout the left lumbar region and extending forward to within 7.5 centimetres of the mammary line, was an area of flatness. The mass in front was not more prominent than it had been but pulsation was not quite so visible. There was considerable tenderness over the original mass. Over the mass in the flank, however, the tenderness was very marked. This whole prominent mass in the flank was pulsating but no bruit was heard over it. The bruit previously heard in the hypochondrium and epigastrium was not present. The blood count had fallen from 3,800,000 to 2,520,000. It was thought that a rupture had taken place into the retro-peritoneum. This became more evident during the next few days, the mass in the flank increasing in size and being directly continuous with the tumour previously felt in front. On the 26th it was noted that the whole

mass pulsated. The following note was made on Oct. 7th, "Large tumour filling whole flank, lifting costal margin. Pulsation remarkably diffuse, visible from lower border of sixth rib to iliac crest and as far over as navel. Tumour has lifted whole costal margin to sixth and seventh interspaces. It bulges in the flank. The pulsation is definitely felt and lifts the finger. Bimanual palpation definitely expansile. No diastolic shock. Loud murmur in middle line, heard along left costal margin, becomes feeble in flank. Second sound heard over front of tumour." Some diminution in the size of the tumour was noted during October and November. On Oct. 10th the patient began to have some fever, the temperature rising to 102° F. On Nov. 13th and 14th it was noted that the tumour was somewhat larger, extending forward farther in the epigastrium. The pain, which was always severe, became worse; the patient's general condition became more serious and he died on Nov. 16th.

Necropsy.—At the post-mortem examination (which was performed by Dr. MacCallum) the following condition was found: aneurysm of the abdominal aorta; encapsulated hæmatoma; erosion of the vertebræ, ribs, and ilium; destruction of the left kidney and adrenal, with obliteration of the renal artery and ureter; cavernous angiomas of the liver; chronic diffuse nephritis; and œdema of the lungs.

There are several points to which reference may be made in these cases. The enormous size of the tumour in Case 2 and the absence of pulsation, the rapid growth, the emaciation, and the anæmia led to the diagnosis of a new growth. The blood obtained on aspiration did not contra-indicate this, as blood is often withdrawn from sarcomata. The irregular masses in front were also suggestive of tumour. The thrill and bruit should perhaps have aroused suspicion but the former, at least, is not infrequently heard over tumours. The absence of pulsation is probably met with when, as in this case, the hæmatoma is enormous and the patient is weak from loss of blood. The same mistake was made by Stokes (Case 80 in his book on the Heart) in a patient with enormous effusion into the mesocolon. In Case 3 the increase in size of the tumour was so rapid that the same mistake was not made. One has to bear in mind, however, that expansile pulsation, quite forcible too, is felt in large sarcomata, more particularly in the big growths from bone, as in the iliac region and the thigh. Even when the sac, as in this case, is laid open the presence of blood and transformed leathery clots is not conclusive evidence for aneurysm. There are old sarcomata among abdominal tumours in which the greater part of the growth is made up of altered reddish-grey, dry blood clot, not unlike that of an aneurysmal sac. Such a case I reported to the Philadelphia Pathological Society in 1886. In Case 16 we had an opportunity of studying the gradual formation of the

secondary tumour which reached a very large size and then shrank a little. The primary tumour has been observed to diminish in size after rupture. The attitude of the patient is sometimes very remarkable. In Case 16 the patient lay for months with the left thigh drawn up and it was impossible to extend the leg. Rapid anæmia, emaciation, and slight fever follow rupture with the formation of a large hæmatoma and these features, added to the presence of a large abdominal tumour, naturally suggest a new growth.

Treatment.—We cannot expect to do much towards the cure of internal aneurysm. Nature occasionally cures a case. I have seen at least two instances of spontaneous healing in aneurysm of the abdominal aorta. Now and again the physician is able to effect a cure. I have not been so fortunate to see such a case. In a few instances the surgeon prolongs life or even effects a complete healing. In the cases here reported the general measures were carried out which are believed to favour coagulation in the sac. We have given them a very full trial, particularly the combination of rest with low diet. Three cases received very full and thorough treatment with gelatine without much benefit. In Case 4 it seemed to do some good and relieved pain. A point of interest in this series is the large number of cases treated surgically. I have to thank my colleague, Dr. Halsted, for his kind interest, and his associate, Dr. Finney, to whom he handed over most of the cases. Dr. Hunner, also, has been helpful. In Case 1 an exploration was made to determine whether anything could be done. The tumour was so moveable that it was thought to be connected possibly with one of the branches of the abdominal aorta, but it was found to spring directly from the vessel itself. The sac seemed so solid, and the old man's condition was so good, that it seemed best to do nothing. In Case 2 a large, diffuse aneurysm was punctured for diagnostic purposes. The three special surgical measures which have been introduced are: ligation of the aorta, compression of the vessel above the sac, and the insertion of foreign material into the sac to promote coagulation with or without electrolysis. In Case 3 an attempt was made to reach the abdominal aorta and to compress it. The sac was opened freely and large clots were turned out, but before the vessel could be compressed above it there was a sudden gush of bright scarlet blood and the patient died suddenly.

There have been about a dozen cases of ligation of the aorta for aneurysm, all, I believe, fatal. Dr. Keen in reporting his case (the twelfth) gives the literature.¹¹ Compression above the sac has been more successful and in the well-known case under Dr. Murray of Newcastle, operated upon in 1863,

¹¹ Philadelphia Medical Journal, 1900, p. 470.

the aneurysm was cured and the patient remained well for six years. In 1864 Mr. Moore of the Middlesex Hospital attempted the cure of aneurysm by the insertion of a foreign body, since which time this method of procedure has been extensively practised and has been modified by Corradi who passed an electric current through the wire. The technique of the operation has been much improved, particularly by Dr. D. D. Stewart of Philadelphia and by Dr. Finney and Dr. Hunner, and in the *Johns Hopkins Bulletin* for 1900 the latter has given a description of the method which has been used in this series. In seven of the cases the sac was wired and an electric current was passed. The results have been as follows: Case 5 died 48 hours after from rupture of the sac into the pleura. Case 8 died on the ninth day from hæmorrhage into the peritoneum. Case 10 was discharged at the end of four weeks, improved; no subsequent history. Case 11 died on the fourteenth day from rupture of the sac. Case 12 was much improved; the pain had diminished, the pulsation was lessened, and he was discharged at the end of a month; no subsequent history. Case 13 was the most satisfactory in the series and may be referred to at some length. The patient was a young man under 30 years of age at the time of onset. When admitted he was suffering greatly and had severe gastric symptoms. The operation was followed by marked improvement, reduction in the size of the sac, disappearance of the pain, and complete relief of the nausea and vomiting. He returned to the hospital every year for a few weeks. At the last visit the sac had increased in size and three and a half years from the date of the operation he died from rupture of the sac. In Case 16 there were three hæmorrhages from the bowels after the operation but for two months there was improvement. Then rupture occurred into the retroperitoneal tissues with the formation of a large tumour filling the left side of the abdomen. Death occurred six and a half months after the operation.

Oxford.

Influenza

Ames Pease & Co

Lyphard Fein

Deveraux

Pharmacology

Engelmann

Amesbury

Laurum gland

Lipomy

Myxoderm

Typhoid.

Centrospondil fever

" " + Arteritis

William Pepper

After 23 years

Typhoid fever

Central Nervous System

Consumption

Splenic anaemia

Endocarditis

Malaria

Cancer of stomach

Tuberculosis

Angine pectoris

Albuminuria

Absence of abdominal muscles

Intermittent claudication

Bilateral extra kidney

Anaemia abasa

Asitis

Cystic kidney

Anaemia dysentery

Aneurysm

Bean root

Mutual Society

Sup bone carcinoma

Onion cyanosis Polythemia