REMARKS ON THE VARIETIES OF CHRONIC CHOREA, AND A REPORT UPON TWO FAMILIES OF THE HEREDITARY FORM, WITH ONE AUTOPSY.  

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NOTHING illustrates so pointedly the widespread interest now taken in diseases of the nervous system than the rapid manner in which facts accumulate about obscure and rare affections. Twenty years have passed since Huntingdon, in a postscript to an every-day sort of article on chorea minor, sketched most graphically, in three or four paragraphs, the characters of a chronic and hereditary form which he, his father and grandfather had observed in Long Island. In the whole range of descriptive nosology there is not, to my knowledge, an instance in which a disease has been so accurately and fully delineated in so few words. No details were given; the original cases were not even (nor have they been) described, but to Huntingdon's

1 Read before the Philadelphia Neurological Society, Nov. 28, 1892.
2 Several years ago I made an attempt to get information about the original family which the Huntingdons described, but their physician stated that, owing to extreme sensitiveness on the subject, the patients could not be seen.
account of the symptomatology no essential fact has been added. Within the past eight years a copious literature has gathered around the subject (particularly in this country), which is available to 1889 in the monograph of Huet. Since this date the interest has even increased, and the references stand thick and close in the Index Medicus for the past three years. The recent paper by Sinkler (Medical Record, March 12, 1892) gives the literature to date. The practical outcome is that we now know the clinical aspects of this form thoroughly, and I have nothing unusual to offer in the history of two Maryland families which I have to report; but the connection of the chronic choreas with each other and their relation to chorea minor are questions which may be discussed, and upon which we need fuller information.

A chronic chorea of adults and aged was recognized long before Huntingdon’s description of an hereditary form in adults, which was itself antedated in this country by the observations of Waters, Gorman, and Lyon.

 provisionally, at least, we may place the cases of chronic chorea in four groups:

First group, chorea of infants, appearing either at birth or within the first two or three years of life. Until recently but little attention has been paid to these interesting cases, of which there have been several well-marked examples at the Philadelphia Infirmary for Nervous Diseases; one has been reported by Sinkler and two by myself. A résumé of the literature to date is given by Audry in his recent monograph upon “Double Athetosis.” The cases heretofore described may be, as he says, divided into those in which no accurate account is given as to the existence of spasm with the movements, and those with explicit statements as to its presence or absence. A majority of these cases are examples really of spastic diplegia, plus movements which may be choreiform, tremulous, or athetoid; or there may even

8 De la chorée chronique, Paris, 1889.
be combinations of mobile spasm with more rapid movements, so that the diagnosis is extremely difficult, one observer calling the case chronic chorea, another double athetosis. This confusion was well illustrated in the discussion at the Berliner Gesellschaft f. Psychiatrie u. Nervenkrankheiten last year, when Remak showed a case of chronic chorea which Oppenheim had regarded as possibly athetosis, and which Senator thought—owing to the existence of spasm—had nothing whatever to do with chorea. In a large proportion of these cases there is also mental impairment, or even idiocy. The following case illustrates choreiform movements in a child with extremely slight spastic manifestations.

Female, aged four and a half years, seen in Ontario, May 12, 1892. One of twins, born prematurely at the eighth month. Mother had one child before, also at eighth month. Nothing abnormal was noticed about the baby at birth, it was not blue, and subsequently thrive well. No abnormality was observed until the other child began to creep, when this one seemed backward and could not hold on to anything. At one year irregular movements were noticed in the arms and legs, and have continued. Teeth were cut at the twelfth month, and she began to talk at the third year; has never walked. The child is bright, intelligent-looking, with well-formed head; does not dribble. There is no nystagmus; talks a gibberish, of which I can only catch a word or two, but which the mother understands quite well. Movements slight in face, scarcely noticeable; no distinct grimaces; movements of tongue natural. The arms are in constant motion, slow and irregular as a rule, but occasionally jerky in trying to grasp objects. The fingers do not display athetoid movements. She cannot use a spoon, but can feed herself with bread, etc. The mother is sure that the arms are never stiff. She sits up well, but the head occasionally comes forward with a jerk. The feet are extended in talipes equinovarus position, and the toes spread occasionally in athetoid movements. The legs are freely movable, not apparently stiff; the muscles hard, but not very well developed. In taking off the stockings, however, the legs stiffened and were hard to bend at the knees, and the big toes became strongly flexed.
This case, belonging to the group described in literature as chorea spastica, is more properly a spastic paraplegia with choreiform and athetoid movements. The following is an illustration of a less common type, in which there was no spasm and the movements were of a more characteristic kind.

N. G., aged eight and a half years, the eldest of two children. The mother had twitching of the eyelids when young, but there are no nervous troubles of any moment in either her own or in her husband’s families. The patient was a delicate infant, but thrrove fairly well, learned to walk and to talk at the usual time. About the fourth year it was noticed that she had irregular jerking movements in the arms, which were moved about wildly and even thrown over the head. She became excitable and irritable, and slept badly. Within a few months the face became affected, and she made grimaces, and sometimes a peculiar grunting noise. The legs were involved shortly after the face, and at times she walked with difficulty. When seen in 1890, more than four years after the onset, she seemed a well-grown child for her age, was not anaemic, a little nervous in her manner and excitable, but intelligent looking. After sitting quietly for a few moments, the arms jerked about and the face twitched. The right arm is most affected, and is twisted about in an odd way, and lifted as high as the shoulder. The legs are now not much, if at all, affected, though she fidgets about in her chair. When watched, the movements are much increased. She feeds herself with great difficulty. There is no spasm in the muscles, which are well nourished; the reflexes are not increased. There is no heart affection. Treatment has not been of the slightest benefit. She is very wayward; and though bright mentally, it is difficult to get her to attend to her studies. There have been no explosive utterances, or any of the mental features of convulsive tic.

And lastly, some of the cases of chronic progressive chorea with dementia have begun in early childhood.

Second group, comprising cases of chronic chorea without any hereditary anlage, in which the disease may set in in childhood, adolescence, maturity, or old age. Many of the cases in Huet’s monograph had no history
of chorea in the ascendants. In scarcely any of the features are these cases to be distinguished from the variety described by Huntingdon, but in many instances the disease has begun in childhood or adolescence, and has gradually led, in a variable period of time, to dementia. Very many cases of this kind have been reported recently from asylums.

Only some of the cases of chorea in the aged can be classed here, since many run an acute course, and recovery is not uncommon, noted indeed in eleven instances in Herringham’s critical review upon chronic chorea, in *Brain* (1888). The acute course, and the association occasionally with rheumatism, render it probable that many of these are really instances of chorea minor.

Third group, including the cases with marked heredity, the so-called Huntingdon’s chorea, characterized by the occurrence in family groups, a late onset, psychical disturbances, and a progressive and fatal course.

Fourth group, comprising cases of chorea minor which pursue a chronic course, and persist for months or even years, and ultimately recover. They differ essentially from the other forms we have been considering, in the absence of a progressive character, the more active, quick, bizarre movements, and the retention of the mental powers. The following is a good illustration of the chronic form of chorea minor:

Alfonzo G., aged twenty-one, baker, applied to the Infirmary of Nervous Diseases, June 1, 1885, with spasmodic movements of the muscles of the face, arms, and trunk. The affection had lasted without intermission since August, 1884. There was no rheumatic history in the family, but a sister had chorea, and subsequently died of heart disease. He is a strongly built, well-nourished young man. The muscles of the head and neck and those of the face contract suddenly, jerking the head upward and rotating it slightly. At the same time he makes a grimace, and the muscles of the thorax are thrown into quick action, and the air is drawn in often with a whistling sound. The heart is not involved.

The patient was under observation and treatment for three years, during which time the chorea persisted with
slight variations in the intensity of the movements. When I last saw him the twitching and jerking of the muscles of the neck and chest were present, but the facial spasm had lessened. There were no mental symptoms, and for the greater portion of the period he was able to work.

Other instances of chronic chorea minor in the records of the Infirmary are given in my "Lectures on Chorea," four of which are very interesting from the persistence of the symptoms for more than three years with ultimate recovery.

Habit spasm, beginning in childhood, may persist for years, and is often confounded with chorea minor; there are also aggravated forms of convulsive tic with movements typically choreic, but which can usually be separated from chorea minor by the existence of fixed ideas, coprolalia, etc.

The following is a record of two family groups of the hereditary form of chronic chorea. The cases present the usual peculiarities described by Huntingdon. For the opportunity of seeing the members of the first family and for the details of the pedigree, I am indebted to Dr. Ellis:

FAMILY X.—FIRST GENERATION.

A. B., an Englishman, married C. D., a native of — County, State of —, and had of issue eleven children. A. B. died aged eighty-seven, and his wife aged eighty-five. Neither of them, so far as is known, displayed any mental or bodily peculiarities. Two of the eleven children died choreic and demented.

Of the other children, two of the girls married N.'s. One died aged seventy-five, leaving children, all of whom are in good health; the other, Mrs. N., still lives, aged seventy-seven, and has healthy children: George, died aged seventy, a bachelor; Sarah, died aged fifty, of typhoid fever, without issue; William, died aged seventy-six, leaving a large family, none of whom have shown any symptoms of the disease; Mary, died of an acute illness, aged fifty-five, leaving healthy issue; Jane, died

*Medical News, Philadelphia, October, 1887.*
aged seventy, leaving a family, none of whom are affected; two other daughters died maidens, well advanced in life. The two affected children were James and Margaret.

James, the first to become affected, began to exhibit remarkable muscular irregularities before he was forty. Dr. Ellis writes: "I very well remember, in my earliest youth, his grotesque movements, exciting unusual attention, and I fear more ridicule than sympathy. His swaying, jerking, and fantastically irregular walk compelled him from the sidewalk to the unobstructed roadway. Notwithstanding his infirmity, he was a great pedestrian, frequently walking from his home, eight miles distant, and returning the same day. His sudden stops and precipitate advance, his facial contortions and mobile features, I recall with great vividness after forty years. His wife died in childbirth.

Margaret, married J. M. Her symptoms began to develop before she was forty. She continued to go about until a few days before her death, which occurred in her sixty-fifth year. Except a short time before her death, she was not entirely helpless, nor were the mental symptoms very strongly marked in her case.

SECOND GENERATION.

Margaret M., the last-mentioned patient, had five children, two of whom have already died of the disease, and three are in various stages of it. I have seen two members of the family, and have performed a post-mortem on a third:

First child, male, now in his sixty-first year. A year ago the first evidences began. "A man of some character, it is but charity to ascribe the eccentricities of his life to disturbed mentality. He married twice, but had issue only by his first wife. Several children died in infancy, but one surviving is now in good health." This patient I could not see.

Second child, female, married, became choreic in her fortieth year, and died demented in December, 1890, in her fifty-eighth year. She was confined to her bed for nearly a year before her death, which occurred in the Pennsylvania Hospital for the Insane, Norristown. She had four children—three girls and one boy; all are living and in good health, the oldest being now in her thirty-second year.
Third child, male, aged fifty-five. I saw this patient with the doctor. He has enjoyed good health, and has been able to attend to his business until recently. When about forty-two he began to get nervous. Irregular locomotion was the first symptom; his speech became affected about a year ago. He will make use of a nod or a grunt in place of words whenever he can. Lately he has been confined to the house, and has been obliged to abandon business. He is very irritable, and is steadily passing into a state of dementia. He has had five children: four are living and in good health, the oldest about thirty-three years of age; one died of basilar meningitis at sixteen. I saw this patient in April, 1889, and made the following note:

Bony, well-built man; face has an intelligent expression. The gait is very peculiar; he sways from side to side; the movements are irregular, very unlike those of an ataxic, but resemble rather those of an alcoholic. He does not use a cane; feet are not specially spread; eyes not directed to the ground. He can stand with his heels together, with his eyes shut; no movements of the hands or arms when at rest, but in attempting to move there are large irregular sweeps of the arms and slight tremor. He has great difficulty in feeding himself, and sometimes takes two hours or more at a meal. He still can write, though with increasing difficulty. He signs his name to a letter, but the pen, in forming the letters, is often jerked up and the signature is very irregular. With the eyes shut he touches the nose or ear with precision and quickly. The grasp of the hand is firm and strong. There is no disturbance of sensation, no numbness or tingling. Knee-jerk slightly increased; ankle clonus not obtainable. Pupils medium size; react to light and on accommodation. Speech is slow, and interrupted frequently by the interjection ‘Hem, ha!’ This peculiarity, his wife says, is of comparatively recent development. The mental condition is apparently good; perception clear. When questioned, however, on several occasions, it seemed to take him some time to understand our wishes. He takes an interest in what is going on; reads a good deal, particularly the newspapers. He still personally conducts his business.

Within the three years and a half since making the preceding note he has steadily declined mentally and bodily.

Fourth child, female, aged forty-three, married, has had five children. One died of scarlet fever; the others
are living, the oldest a boy of twenty-three. In this case
the disease has progressed with greater rapidity than in
the others, and certain indications of it have been pres-
ent, according to the doctor, since her thirty-fourth year.
The mental symptoms were first to appear. In April,
1889, I made the following note:
Slightly built, somewhat anaemic woman; talks clearly
and rapidly, but occasionally she displays a certain child-
ishness, and the doctor, who has not seen her for some
years, was much struck with the change in this respect.
While sitting quietly there were no irregular move-
ments of her limbs, but occasionally there was a slight
jerk of the finger, the shoulders would move, and once or
twice, while speaking, there appeared to be irregular
contraction of the facial muscles. There is no trémor of
the tongue, and the pharyngeal muscles act normally;
the grasp is good; she can use her fingers for delicate
movements, and can thread a needle, and there does not
appear to be the slightest inco-ordination. The most
marked change appeared to be noticed in her gait. She
walks with the feet somewhat spread, but follows a
straight line fairly well; she turns with a little difficulty,
and, if rapidly, loses her balance. Her head is carried
somewhat stiffly in walking; she does not trip, and she
walks in the dark quite well. She stands with her eyes
shut and her feet together without swaying.
The power of the legs is good; knee-jerk increased
on both sides; no disturbances of sensation; special
senses normal; the pupils are of medium size and react
to light and on accommodation. In the three years since
the preceding note was made she has lost ground rapidly,
and the muscular inco-ordination has become much worse.
She is now confined to the house, and for the greater part
of the time to her bed.
Fifth child, female, aged, at the time of her death,
fifty-one; married; had eight children. Dr. Ellis writes:
"After the birth of seventh child, in her thirty-second
year, her husband noticed the beginning of the trouble
in jerking movements of the legs when sitting, and when
erect she had a trick of raising her heels suddenly and
standing upon the ball of the toes. Irregular movements
of the arms speedily followed. When I saw her first, in
1880, she could walk a mile or two without apparent
fatigue, and would insist on walking to church, nearly a
mile distant, repelling the suggestion that she could not
walk as well as another. At this time, in walking, her
body would be bent forward, her head jerking, with a pendulum-like motion, to and fro, and her legs making such irregular and large movements that she would make wide excursions on the sidewalk. A year later she could no longer go out without assistance. Her speech indicated marked changes very early, in her fortieth year, and this was (in 1881 and 1882) accompanied by great difficulty in swallowing and frequently with alarming spells of strangling. She was a most pitiable sight. She suffered also from procidentia uteri; yet in June, 1883, in her forty-third year, she was delivered of her eighth child, which survived but a few days. Her menses were perfectly regular, her menopause occurring in her forty-eighth year. Six months before her death she was confined to her bed, utterly helpless, and was fed with a spoon. She was now entirely demented.

"Her deep reflexes were rather exaggerated. She could go about the house at night with as little help as in the daylight. She was exceedingly irritable and cross. The choreic movements stopped in sleep; there was no palsy of the sphincters. Of her eight children, seven are living, the oldest in her thirty-third year; all are in good health."

Post-Mortem (about thirty hours after death).—Considerable wasting of the body; no enlargements of joints; no abnormal position of limbs; face a great deal wasted, presenting several recent scars and abrasions, the result of falls.

The skull-cap of moderate thickness; dura tense; meningeal vessels looked stiff; longitudinal sinus contained recent clots. On the exposed cortex cerebri the arachnoid was somewhat turbid and universally separated from the pia by a considerable layer of serous exudate; this was especially marked over the sulci. Pacchionian granulations were numerous; cortical veins moderately full. At the base the arachnoid was turbid and the larger arteries a little stiff; the meninges were not especially adherent, and the pia could be stripped without tearing the substance. Superficial examination revealed no areas of softening, and no special lesions of hemispheres or of cerebellum. There was general wasting of the convolutions, which were also, on section, rather firm. The gray matter was dark, and in places looked thinner than normal. The crura presented no signs of descending degeneration; the pons and medulla were natural-looking; anterior pyramids had a clear, normal
aspect; the ventricles were not distended. Spinal cord was firm; arachnoid a little opaque; pia normal. Transverse sections showed no systemic degenerations; the gray matter had a rosy red tint.

**Microscopical Examination.**—I am indebted to Dr. Gray for an extensive series of sections from various parts of the brain and cord. The changes may thus be summarized: The arteries were thickened and in places showed hyaline degenerations, and, in the smaller arterioles, fatty changes, very marked in the fresh specimens from the cortex. Here and there the perivascular lymph-spaces were large and contained leucocytes. The ganglion cells in many sections showed very slight changes, not more than are often seen in chronic disorders associated with atrophy of the convolutions. There was the common vacuolation, and many cells seemed laden with pigment. The increase in the connective-tissue elements was more evident to the touch and on section than microscopically. Sections of the pons and medulla showed no special foci of disease. Beyond thickening of the arteries and a shrinkage in the cells of the anterior cornua (probably an artificial change), the sections of the cord showed no important lesions.

The morbid anatomy of chronic chorea is that of a neuro-degenerative disorder—diffuse changes in vascular, ganglionic, and neuroglial tissues—not essentially different to, though less pronounced than, those of dementia paralytica. We see, too, the terminal series of the process, far removed in time from, not necessarily akin to, the initial alteration which lies at the basis of the disordered function.

The doctor writes that, prior to the onset of the chorea, "these patients and their children are intelligent and bright, and the women are comely. The men are rather aggressive, energetic, and ferocious; the women are affectionate and prolific: the issue of the five numbers twenty-seven. There is no history of infantile chorea in the family, nor of rheumatism, nor of heart disease. The period of development of the symptoms covers a wide range, from the twenty-second to the sixtieth year. The symptoms have begun earlier in the women than in the men. There is at present no sign of disease in any
member of the third generation, though several of the children are past thirty-five. There seems to be a remarkable insensibility to pain in these cases; they fall about and bruise themselves severely without complaint. Shortly before the death of No. 4, she struck a cast-iron key, lodged in the door-lock, with her hand and broke it, naturally bruising and maiming her hand very much; but of this she took no notice whatever. The uncle and the mother of these patients kept about and showed much greater muscular vigor than members of the second generation, in whom, too, the dementia has apparently progressed more rapidly. The progress of the disease is marked by great emaciation; the movements are but little under control of the will and are much excited by volition. When standing, only those muscles are much affected which are concerned in balancing the spinal column and the head; the movements stop during sleep. These patients have all been light sleepers. The speech defect is not aphasic, but muscular—an indisposition to articulate on account of difficulty in moving the muscles. In case No. 4 the symptoms were very similar to those of a case of bulbar paralysis."

NEITER FAMILY.

So far as can be ascertained only four members of the family have been affected, namely: mother and three children, one of whom was our patient, Peter.

1. The mother, a German, is stated to have had trouble of the same kind as that which Peter has. For many years she made wild inco-ordinate movements with her arms, and toward the end of her life she could not eat alone and had to be fed. Her mind, also, became very weak. The exact duration of the disease in her case could not be obtained, but it extended over several years. She is said to have died of heart disease. She has one brother living, aged eighty-three, who is said to have the disease, but Dr. Simon visited him and reports that he is only subject to ordinary senile tremor. No information is available with reference to her family. Her maiden
name was Schmidt. She had four children, of whom three have been affected with the disease.

2. Lizzie N., was well up in her thirty-seventh year; married and had six children, of whom two died and four are living and well. After the birth of her last child the chorea developed, beginning in her arms first. Her husband noticed that she frequently dropped things. The trouble gradually became worse. Her mind became seriously affected, she talked incoherently, and had strange ideas. She once tried to commit suicide by jumping out of a window. The last year of her life she was helpless and could not walk alone. She died in her forty-ninth year, about twelve years after the first onset of the symptoms. Her husband, from whom these facts were obtained, says that the disease looked very much like St. Vitus' dance.

3. Nicholas Neiter, aged about forty, blacksmith, living at Edgewood, Hartford Co., Md. He was seen for me by Dr. Chas. Simon, who reports that he is evidently subject to the disease, as he displays grotesque inco-ordinate movements of the legs, arms, and face. Mentally, too, he is inclined to be childish and is very emotional. He regards himself, however, as in a condition of perfect health and not affected in any way as his brother Peter.

4. Peter Neiter, aged fifty-nine, German, a butcher, was admitted to Johns Hopkins Hospital, October 9, 1890. Patient has been in this country since 1850. He has always enjoyed good health with the exception of malaria when he first came to this country; has not had syphilis. He dates his present trouble from an attack of gastrointestinal disturbance eight years ago, which followed the drinking of large quantities of iced lemonade. At this time he had also pains in the head, and he speaks of the occurrence of something bursting in his body like a cannon. The movements began about five days after this over-heating and taking iced drinks. They did not start at any particular part of the body, but were general from the outset. They have gradually become worse, particularly when voluntary movements are made. They are severe enough to prevent him from working, and he has not been able to do much for six or eight years. He has fallen, sometimes, owing to the irregular movements of the legs. He has never at any time lost consciousness.

5 The patient was shown at the Hospital Medical Society, and is reported in the Bulletin, vol. i.
Emotion or fright always exaggerates the movements. He has not had headaches; has as a rule slept well. His appetite has been good and general health excellent. Ever since the attack, eight years ago, he has been liable to a recurrence of the vomiting whenever he takes cold drinks. He says his memory is quite good. He does not think that his speech has been affected.

*Present Condition.*—The patient is a large, well-nourished, well-built man. The face in repose looks intelligent, but on smiling, the expression is fatuous. He answers all questions readily and freely; gives a good account of his condition, and it is more in his expression and general behaviour that an indication is found of mental impairment.

When sitting in a chair, at ease, the arms and hands are in more or less constant irregular motion. The fingers are extended and flexed alternately; sometimes only one, sometimes the entire set. At other times the whole hand will be lifted or there are constant movements of pronation or of supination. For half a minute or so they may be perfectly motionless. The head and trunk present occasional slow movements; in the latter more of a swaying character. The legs jerk irregularly and the feet are flexed or extended; but the movements are not so frequent as in the arms. The face in repose is usually motionless, but the lips are occasionally brought together more tightly and the chin elevated or depressed. There is an occasional movement of the zygomatic and of the frontal muscles. He puts out the tongue, with tolerably active associated movements of the face, and it is usually quickly withdrawn or rolled from side to side. It is impossible for him to hold it out for any length of time. There are no irregular movements of the palate muscles.

He walks with a curious irregular gait, displaying distinct inco-ordination, swaying as he goes, hesitating a moment in a step, keeping the arms out from the body and in constant motion. The legs are spread wide apart; steps are unequal in length and he seems rather to drag the feet. He stands well with the heels close together.

There is a suggestion of stiffness about the gait and about the way in which he uses his legs.

Sensation is unaffected. The deep reflexes are increased. There is slight ankle clonus, exaggerated knee-jerk, and slight increase in arm-reflexes.

The special senses are unimpaired. Pupils are of
medium size—the right a little larger than the left; they react to light and on accommodation; there is no nystagmus. He has no fever; bowels are regular, and the urine shows no special changes.

A report of cases of the hereditary form of chorea does not afford a very wide scope for discussion; but there are problems in the relation of the forms to each other and to chorea minor, which, if I have read the literature aright, are still far from settled. My own point of view may be very briefly stated: Chronic progressive chorea is a malady distinct from the various disorders associated with coarse lesions of the motor centres or path known as symptomatic chorea—an affection which (like forms of muscular atrophy) may occur in families or in single individuals, and is characterized by irregular, inco-ordinate movements, a reeling gait, speech disturbances, and progressive impairment of the mental faculties. The movements differ from those seen in chorea minor, being slower, and resembling rather those of Friedreich's ataxia, without the brusque, jerky character of the former disease. Moreover, in striking contrast to the movements of chorea minor, those of chronic progressive chorea are sometimes influenced by the will.

A certain number of the cases of chronic chorea beginning in infancy and childhood belong to this category, but a very much larger number are instances of spastic paraplegia or diplegia; while others represent anomalous forms of chorea minor.

Chronic progressive chorea is, I believe, a disease wholly apart from the affection described by Sydenham, having nothing in common with it but the name. The course of acute chorea minor, the incidence in children, the arthritis, the seasonal relations, the extraordinary frequency of endocarditis—to say nothing of the different characters of the movements above referred to—separate it as a well-defined affection, depending possibly on a virus as yet unknown.
NOTE ON ARSENICAL NEURITIS

FOLLOWING THE

USE OF FOWLER’S Solution (34 51 ml 18).*

By Wm. Osler, M.D., F. R. C. P., London.

During the first few years of practice I was in the habit of using arsenic somewhat sparingly, but after the appearance of Bramwell’s paper in 1877, on the use of this drug in pernicious anaemia, I began in the cases which came under my observation to use it more freely, and since that time in various forms of anaemia, in leukæmia, in Hodgkin’s disease, and chorea minor I have used it in what might be called large doses. My rule has been to begin with two or three minims three times a day, and gradually increase the dose every four or five days until the patient took ten, fifteen or twenty minims of Fowler’s solution three times a day. I preferred to see the physiological effects, either itching of the skin, slight oedema, an attack of vomiting, or diarrhœa. The quantity which will induce these symptoms varies in different individuals, and in the anaemia cases those who bear the drug best seem to improve the most rapidly. The largest doses I have given were in a case of pernicious anaemia, in which the patient had taken during his primary attack with the greatest benefit for several weeks twenty minims of Fowler’s solution three times a day; and had reached in his relapse thirty minims three times a day, when at the end of a week he had an attack of itching of the eye lids, and oedema over the eye brows.

* Read before the Johns Hopkins Hospital Medical Society, February 20th, 1893.
In the chorea minor of children, who, as is well known, stand arsenic well, it is a common experience to find that twelve and fifteen minims of the liquor arsenicalis may be given daily without ill effects. Until two years ago, though I had often seen the symptoms of saturation above referred to, I had never seen any serious toxic symptoms referable to the nervous system, but we had at that time in the ward a patient with pernicious anæmia who had taken for a long time large doses of Fowler’s solution, and under its use had feelings of numbness and tingling in the feet and legs, which we thought might be due to the arsenic. This may not, however, have been so, since these advanced cases not infrequently have sclerosis of the posterior columns of the cord, in connection with which loss of the knee jerk and sensory changes in the legs may develop. I have repeatedly in my clinics and ward class talks referred to the apparent harmlessness, so far as my experience went, of Fowler’s solution.

On October 25th, 1892, the patient before you was admitted to my wards with Hodgkin’s disease, the cervical, axillary, and inguinal groups of glands being involved. Having had under observation for now nearly four years a case of this disease, which has been remarkably benefited by the prolonged use of Fowler’s solution taken at intervals, we naturally placed this man upon the same drug. The details of his case, so far as they relate to the lymphatic disorder do not concern us. The arsenic was begun on October 27th, given as Fowler’s solution, and gradually increased. He took it on the first occasion for ten days; it was then resumed on November 14th, and in two weeks the dose reached fifteen minims three times a day. Towards the end of November it was noted that his skin, which was naturally of a somewhat dark colour, had a much deeper tint, and that of the abdomen was very distinctly bronzed. Throughout the month of December he did not do well. The arsenic was stopped on the 19th, and begun again on the 27th. From the outset the patient has had that interesting feature in many cases of Hodgkin’s disease, an intermittent pyrexia, and as may be seen by his last week’s chart, the
temperature rises every afternoon and evening to about 104°. The pigmentation seemed to increase throughout December. Twice during the first two months of his stay in hospital there was slight diarrhœa, which was attributed to the arsenic. About the middle of January it was noticed that he was tender to the touch, and walked somewhat stiffly. He is a Pole, speaking no English, and as there was no one in the ward to interpret for him, these symptoms did not perhaps at first attract the attention they deserved. The most striking feature at this time was the sensitiveness on pressure. The skin itself did not appear to be painful, but if, for example, the arm was grasped, or the pectoral muscle lifted, or the thigh pinched, he winced and tears came into his eyes. By the end of January he walked with much difficulty, and could scarcely go from his bed to the closet. He has naturally, in the course of his disease, wasted a good deal, but the legs seem to have become distinctly more flabby within the past two or three weeks. The knee jerks, which were present on January 10th, are now absent.

On February 2nd, Dr. Hoch reported the faradic excitability of the nerves of the leg was diminished, the galvanic also to a slight extent. In the muscles the diminution to both currents was more marked, and the contraction following the galvanic stimulation was decidedly slower and the anode, if not larger, was at least equal to the K. C. C. The muscular power in the arms is not so strikingly diminished, though the grasp is feeble in comparison with what it was. The hyper-sensitiveness of the muscles does not appear to be at all diminished.

Between the 27th of October, and the 10th of January, this patient took 34 31 m 18 of the liquor potassœ arsenitis, equivalent to about 16½ grains of arsenious acid. During these seventy-five days there were fourteen days in which the drug was omitted. The marked sensory changes, the gradual impairment of muscular power, and the progressive character of the symptoms indicate very clearly the peripheral and neuritic nature of the affection; and though he has a chronic cachexia, in which, as in cancer or tuberculosis, neuritis might develop, yet it seems more rational to attribute it to the somewhat
prolonged use of the arsenic, more particularly as he has had also another striking feature of arsenical poisoning, namely, pigmentation of the skin.

Arsenical neuritis from accidental poisoning is not very uncommon. Less commonly it results from accidental contamination in certain occupations. It is claimed by Folsom, Putnam, and others in Boston, that cases may be of "domestic origin," that is, due to the absorption of extremely small quantities of arsenic with the dust from wall papers, carpets, or curtains. Cases such as the one reported this evening, in which the toxic symptoms have developed in consequence of the administration of arsenic as a medicine are in reality extremely rare. A few years ago Dr. J. J. Putnam collected a series of cases in which serious poisonous effects had followed the long continued use of medicinal doses. A majority of them cannot be said to be very satisfactory, as the reports are imperfect as to the amount taken and as to the symptoms. Among the cases referred to are, however, some which would indicate very clearly that the prolonged use of even moderate doses may cause symptoms of a wide-spread neuritis. Individual idiosyncrasy plays, no doubt, an important role; tolerance may as a rule be established, as with the Styrian arsenic eaters, but such cases as the one before you show that we must be on our guard in the protracted administration of the drug.
NOTE ON A REMARKABLE HOUSE EPIDEMIC OF TYPHOID FEVER.

By William Osler, M.D.,

Professor of Medicine in the Johns Hopkins University.
HOUSE epidemics of typhoid fever, to the extent and severity of
the one here noted, are very rare.

November 26, 1892, I went near Darlington, above Havre de
Grace, Md., to see a case in connection with which Dr. Sappington
gave me the following remarkable history of a house epidemic of
typhoid fever:

CASE I.—Wm. B., aged 37, had been ill early in August, at
Ocean City, with what was supposed to be malaria. He returned to
his home in Baltimore August 8, and on the 13th came here to his
mother's home, and was ill for six weeks with diarrhea and delirium;
and had, according to the doctor, a well-marked attack of typhoid
fever. There had been no previous illness during the summer in the
house, and it is perfectly clear that this, the first case, was imported.

CASE II.—His wife, A. B., aged 34, was taken ill about the 29th
of September with typhoid fever; well-marked case; fever 101° to 104°.
At the end of four weeks she was better. She was moved, had hemor-
rhages, and again was ill six weeks, but ultimately recovered.

CASE III.—His sister, M. B., aged 28, was taken ill about the
29th of September, had a very bad attack, and gradually recovered.

CASE IV.—J. B., a sister, aged 21, was also taken ill about the
third week in September, had fever, not very bad at first, and subse-
quently had severe hemorrhages, and died October 12.

CASE V.—John B., aged 3, son of Wm. B. (Case I), came with his
mother from Baltimore, and was taken ill about the third week in September. He had a mild attack, with fever, abdominal symptoms, and well-marked rose spots.

Case VI.—John B., aged 35; fever began toward the end of September. He had headaches, diarrhea, and a tolerably sharp attack. Convalescence began about October 17th; the temperature remained about normal until October 24th, then he had a definite relapse, with fever ranging to 104° and 105°. From November 8th until the 14th there was a period of apyrexia, and then the temperature rose again, and I saw him on the 26th in what appears to be a second relapse. The temperature has been up to 103° and 104°, and on several occasions 105°. On the 25th, for instance, temperature range was between 101° and 105°. He has been delirious, and has had several chills; great pain in his legs, and very great tenderness of feet, especially on the soles.

This case was away from the house at Annapolis a short time, and was the last to take the fever.

Case VII.—Nurse T., taken ill on the 17th of October, and was removed to the Homeopathic Hospital in Baltimore, where she had a well-characterized attack of typhoid fever, of which she died. She had been in the house forty-two days.

Case VIII.—Colored nurse of child; was taken ill about the 10th of October, went to Baltimore, and had a definite attack of typhoid fever and died. She had been in the house twenty-six days.

Case IX.—Miss G., nurse, had been in the house forty-two days, and was taken to Philadelphia, ill with typhoid fever, and died in the third week of the attack.

Case X.—B. B., a sister, had also, according to the doctor's description, typhoid fever, but she kept about the house, and would not go to bed for any length of time.

During the months of August, September, October and November there were ten cases and four deaths.

The house, a comfortable, old-fashioned, square stone building, is situated on a ridge in the beautiful rolling district of Hartford County, only a few miles from the Susquehanna River. In front of the house the ground slopes rapidly toward the roadway, which runs along a narrow valley. At the back of the house the land slopes more gradually. At a distance of about seventy-eight yards in front and to the left of the stone house, and about two-thirds of the way down the hill, is a comfortable frame house, occupied by the tenant, with a family of nine, of ages from 14 to 85. About seventy yards further down the valley, close to the roadway, is a spring of clear water, close to which is erected the "spring house" for dairy purposes.
Opening from the kitchen of Mr. B’s house, which is a T-shaped extension, there is a covered stoop or porch, beneath the floor of which is a cistern, square, with a depth of nine feet, width of ten feet, the bottom of which is ten feet below the surface of the soil. It is cemented, and was last cleaned about May, 1892. This cistern collects the water from the roof, and at one time also received water from the spring, which was pumped up by a ram. This was abandoned years ago.

Immediately behind the kitchen, at a distance of about twenty feet, is a wood-shed, and a privy, which is situated on the slope of ground behind the house. The bottom of the privy is on the level of the ground. The difference in level between the bottom of the cistern and the top of the privy is, Mr. B. thinks, about ten feet. This practically is the situation of the surroundings. The house itself inside is comfortable; the rooms are large and convenient. There is nothing whatever in their arrangement to call for special comment.

Dr. Sappington writes that “the household consisted of another brother, who did not go into the sick rooms, but ate the food and drank the water, as did also a colored boy aged 15, also the mother (Mrs. B.), also Dr. Sappington drank freely of the spring water, and often had his dinner at the house. A cook could be kept only a short time after the third week, and many things were supplied by their friends.”

The source of infection in this epidemic is very difficult to trace. One thing only is certain, namely, that the spring water was not at fault, since living close by and using the water freely was the family of the tenant, every member of which escaped. Two alternatives remain, either the food supplies or the kitchen utensils were in some way infected from the first case, which seems to be by far the most likely view, or the disease was propagated by direct contagion, a view which Dr. Sappington holds very firmly, but which, though not impossible, does not seem to be very likely when one considers the extreme rarity of direct infection in this disease.

Though the surface slope is from the cistern, yet it is quite possible that it may have been contaminated, and if the water was used for washing the kitchen utensils (upon which point it is impossible to get positive information), this would be the most likely source of infection.
CASES

OF

SUB-PHRENIC ABSCESS

BY

WILLIAM OSLER, M.D.,

PROFESSOR OF MEDICINE, JOHNS HOPKINS UNIVERSITY, BALTIMORE.

Read before the Association of American Physicians, May, 1893, and reprinted from "The Canadian Practitioner."

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THE J. E. BRYANT COMPANY, LIMITED,
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THE following cases illustrate some of the forms of abscess beneath the diaphragm. Three contained air and simulated pyo-pneumothorax; in two, the condition was strikingly similar to empyema. The pus may be either in the cavity of the lesser peritoneum, which is commonly the case when perforation of the posterior wall of the stomach, or of the duodenum, occurs, and the abscess is then chiefly beneath the left half of the diaphragm; or it may be between the right lobe of the liver and the diaphragm, in which case the abscess is really within the general peritoneum, though usually shut off. The abscess may come from perforation of the ascending colon, or of the appendix, or from the liver itself. In the air-containing abscesses the most exquisite simulation of pneumothorax may occur on either side, as in the case which first called my attention to this condition, reported by Dr. Gardner,† of Montreal, in which the signs of pneumothorax extended as high as the third right interspace, and in which, post mortem, the diaphragm was found at the level of the third interspace.

Case II. is of interest from the development of an air-containing abscess, in consequence of the perforation of the colon and communication with a perinephritic abscess on the right side. It had perforated the diaphragm and produced a pleurisy at the right base.

In Case III., on the other hand, there was, following injury to the kidney, an empyema which had perforated into the lung, and the sub-phrenic abscess received its air supply from this source, which is somewhat unusual.

The two cases of simple sub-phrenic abscess are of doubtful etiology, and are of interest chiefly from the remarkable simulation of empyema and the good results which followed operation.

Case I. is one of the few instances in which the diagnosis of pyo-pneumothorax sub-phrenicus was made during life, and in which recovery followed operation.

* Read before the Association of American Physicians, May, 1893.
†Canada Medical and Surgical Journal, vol. ix.
CASE I. History of dysentery; symptoms of abscess of liver: development of a large area of tympanitic resonance in the right lower axillary region; diagnosis of pro-pneumothorax sub-phrenicus; operation; recovery. John S., aged thirty-six, was admitted to the Johns Hopkins Hospital on January 16th, 1890, complaining of fever, diarrhea, and pain in the abdomen. There was nothing of moment in his family history. He had typhoid fever when twelve years of age. He had gonorrhea, but not syphilis. He has been a very hard drinker for very many years. In September, 1888, he had dysentery; not a very severe attack, as he was not laid up in bed; but the stools were frequent, and he passed blood and mucus. He has not been entirely free from intestinal trouble since, but he has been able to keep at work with but few interruptions. Latterly he has lost flesh, and within the past six weeks has become very weak and feverish. On several occasions the feet have swollen. He has had no chills; has never been jaundiced, and has never had severe pain in the region of the liver. He stopped work two weeks ago.

Condition on admission. Emaciated; weight 116 pounds; anemic; muscles flabby; skin hot, dry, and sallow; conjunctivae white; tongue pale, indented, and with numerous aphthous sores on dorsum and sides. Pulse 96; respiration 30; temperature 101°. Lungs are normal, with the exception of a few dry crepitant râles, probably pleuritic, at the right base.

Cardiac dullness begins at the fourth rib. There is a soft systolic apex murmur. The second sound is reduplicated at base.

Liver. No prominence in hepatic region. No tenderness on pressure. Dullness begins in nipple line at fifth interspace and extends about 4 cm. below the costal margin, 15 cm. in vertical extent. The edge cannot be distinctly made out. The surface beneath the costal margin is not rough, nor tender. In the median line, dullness extends 3 cm. below the tip of ensiform cartilage.

Spleen not palpable. Area of dullness not increased.

The abdomen is symmetrical, a little full, tympanitic, nowhere tender. Examination of blood negative.

Urine. Specific gravity 1019; reaction acid. Trace of albumin. No tube casts.

The stools were frequent, liquid, and contained much mucus.

From the history of the case and from the appearance of the man abscess of the liver was suspected.

For the first ten days in the hospital the patient seemed better. The number of stools in the day reduced. He had no chills. On several occasions he sweated heavily at night. The temperature range was from 98° to 102°.
On the 24th it was noted that "there is distinct tenderness in the right renal region, best elicited on bimanual palpation. No special fullness. No dullness in the right flank. Liver dullness is not increased in the lateral region; in the posterior axillary line it begins at the eighth rib and extends to the costal margin."

January 8th. The tenderness on the right side has increased, and it is specially noticeable at the extremity of the tenth rib when pressure is made upward. There is here a distinct sense of fullness and resistance. To-day there was noticed on percussion a remarkably tympanic percussion note between the ninth and eleventh ribs on the right side. An exploratory puncture, in the tenth interspace, posterior axillary line, obtained a small amount of curdy, thick pus, which contained altered pus cells, and a few fat crystals. The following note was dictated:

In the right flank the fingers can be passed well toward the kidney with, perhaps, slight sense of increased resistance. With bimanual palpation there is certainly great resistance below costal margin, and especially below points of the tenth and eleventh ribs; here there is also marked tenderness. From behind there is distinct fullness in the infra-scapular region on the right side, and intercostal spaces are here not so well marked. There is no distinct tenderness in right lumbar space beyond. Liver dullness in mid-sternal line, extends three fingers' breadth (5 cm.); in nipple line, from lower margin of the fifth to costal border. In mid-axillary line there is a pulmonary note to lower margin of sixth. There is dullness for a finger's breadth on the seventh rib, and, below, the most extreme metallic tympany, extending from exactly the seventh interspace to upper margin of eleventh, where it passes on insensibly into bowel tympany. There does appear, however, to be a slightly dull note before bowel tympany is reached. Anteriorly, the metallic tympany extends to within 4 cm. of nipple line. Behind, it extends to posterior axillary line. When turned on side, percussion in axillary line is distinctly flatter, and there is movable dullness. Altogether, tympanic area occupies position of seventh to tenth interspace in a line drawn at the level of ensiform cartilage. A diagnosis of a subphrenic air-containing abscess was made, and the patient was transferred to the surgical department.

On the 29th Dr. Halsted resected about an inch and a half of the tenth rib in the mid-axillary line, and removed about a litre of a thick, gumous pus, which had an acid reaction, and very distinct odor of vomit. The patient rallied well from the operation.

February 2nd. The last few days the patient has had a slight elevation of temperature. His general condition, however, is good. The tympanic note is even more intense than before the operation, and it is almost amphoric in character. It extends anteriorly as far as the nipple line,
where it is only 10 cm. from the nipple line. The area is triangular in shape, the apex being toward the sternum. It is 15 cm. in transverse diameter. The liver seems pushed far over into the left hypochondrium.

10th. Since the last note the patient’s condition has rapidly improved. The temperature has been but slightly above normal, the sweats have stopped, the diarrhea checked, and his appetite has become very good. The wound is dressed every day and the cavity irrigated. Dr. Halstead is now able to pass his finger far down into the flank, reaching quite to the level of the crest of the ilium. A flat tympany extends in the mid axillary line from the lower margin of the eighth to the iliac crest.

14th. General condition remains excellent. The cavity has reduced very considerably and the discharge has lessened.

The improvement continued, and the patient was discharged well.

CASE II. Tuberculous pyelo-nephritis; tuberculous colitis; perforation at splenic flexure of colon, with the formation of a perinephritic air-containing abscess; prominent tumor over tenth, eleventh, and twelfth ribs behind; incision and drainage; pulmonary tuberculosis; death; autopsy. In October, 1887, I saw, with Dr. R. H. Harte, of Philadelphia, a case which illustrates a somewhat unusual form of this condition. He was a young man, aged about thirty, who, as early as 1880, had passed blood and clots with the urine, and was sent to California under the impression that he had Bright’s disease. He lived a pretty hard life, and had been treated for stricture of the urethra and irritable bladder. When Dr. Harte saw him in July he had lost much flesh, was very pale, but was still fairly muscular. The urine contained pus and blood; the bladder was very irritabile, and micturition was very frequent.

Early in September he had chills, which were supposed to be malarial; with these the fever was high, and he sweated heavily. In the middle of October diarrhea of an obstinate character set in. When I saw him he was pale, somewhat emaciated, with an irregular fever and occasional chills, which were evidently of a septic nature. He had profuse diarrhea, and the stools, at times, contained small quantities of pus. The urine was very purulent. On examination of the abdomen nothing of special note was observed. Behind, on the left side, beneath the skin over tenth, eleventh, and twelfth ribs, there was a prominent tumor, somewhat hemispherical in outline, and nearly equal in extent to the palm of the hand. It was soft, not specially tender, and, on percussion, when he was in an erect posture or on his belly, gave a most remarkable tympanitic note. On the other hand, when he was on his left side or back the note was dull. On coughing there was a distinct impulse in the tumor. Anteriorly, there was nothing to be felt on deep pressure, but there was evident thickening and pain in the left lumbar region. It was thought at first that this projection
might possibly be hernial, though in an unlikely position. Aspiration, however, revealed the presence of pus, and it was thought to be perinephritic abscess which had communication with the bowel. On November 1st he was taken to the University Hospital, and Dr. Agnew laid open freely the abscess. There was evidently communication with the bowel, as fig-seeds were, on several occasions, noticed in the dressing. Gradual signs of involvement of the left lung came on, and he sank and died about January 1st.

The *post mortem* showed extensive old tuberculous disease of the left kidney. An abscess cavity, the size of a cocoanut, surrounded it and communicated with the colon at the splenic flexure through an opening which would admit a lead pencil. The abscess had perforated the diaphragm and produced pleurisy at the right base. There was extensive and progressing tubercular disease of the right lung. The right kidney presented a number of small tuberculous abscesses. The bladder was thickened and contracted, and presented tuberculous ulcers. There was an abscess of the prostate which opened into the bladder. The ureters were thickened and ulcerated.

The condition has been met with following injury, as in the following case, which was transferred to my wards from the surgical side at the University Hospital, Philadelphia.

**Case III.** Injury to arm and back; hematuria; amputation of arm; erysipelas; three weeks after accident signs of inflammation at the left base; development of a pyo-pneumothorax; expectoration of fetid pus; septic fever; asthenia; death; autopsy.

William S., aged twenty-four years, was admitted to the surgical wards of the University Hospital on November 13th, 1885, having fallen under the wheels of an engine. The left arm was crushed, and he had a deep scalp wound. The arm was amputated at the upper third. For a week he had hematuria, and he complained of a pain in his left side. Subsequently erysipelas developed in both arm and face. About three weeks after admission signs of inflammation appeared in the left infra-scapular region, indicated by a rise of temperature, dullness, and feeble, blowing breathing, and he was transferred to the medical ward. The stump at this time had almost healed. Examination of the chest revealed a circumscribed dullness at the left base, extending nearly as high as the angle of the scapula, and, laterally, to the mid-axillary line. Tactile fremitus was diminished; on auscultation, feeble, blowing breathing, and, on deep inspiration, râles. Slight cough; very little expectoration. A septic pleurisy was suspected. The condition remained practically unchanged for several weeks, during which there was irregular septic fever. He complained at times of pain in the iliac region and left side, particu-
larly when he drew a deep breath. He soon began to spit up fetid pus, and in twenty-four hours brought up several ounces. It was concluded that a localized empyema had perforated the lung. On examination, tympanitic resonance, amphoric breathing, and metallic rales were found low down in the postero-lateral region, beneath the eighth, ninth, and tenth ribs, indicating pneumothorax.

The autopsy showed the existence of a large abscess behind the left kidney and descending colon, extending from the diaphragm to the crest of the ilium. The chief part of the abscess lay above the kidney and beneath the diaphragm, and in this region there was a distinct cavity, partially occupied by dirty-brown pus, similar to that which the patient had expectorated during the last two days of his life. Part of the diaphragm was in a sloughy condition, and two orifices, through each of which the point of the index finger could be passed, communicated directly with an abscess cavity in the lower lobe of the left lung. The pleural membrane of this part was greatly thickened, and there was a small localized empyema between the layers. There were areas of recent broncho-pneumonia throughout the other lobe. The left kidney was small, and presented at its upper part a distinct cicatrix, to which the capsule and adjacent tissues were strongly adherent.

The sequence of events in this case was, probably, as follows: Wound of kidney with bruising of tissue in lumbar region; sub-phrenic abscess; localized empyema, probably from contiguity with sub-phrenic abscess; perforation of diaphragm and lung, with discharge of pus; development of a sub-phrenic air-containing cavity which gave, in the lower and lateral aspects of the left side, the signs of pneumothorax.

I regarded this case, when admitted to my wards, as one of septic pleurisy, passing on to empyema and perforation of the lung. The physical signs of pneumothorax were of the most characteristic kind, and I must confess that it never once occurred to me that the air-containing cavity was below, not above, the diaphragm.

CASE 4. Acute illness; signs of empyema; operation; pleura free; evacuation of large sub-phrenic abscess. John M., aged twenty-four, fireman, admitted April 30th, 1892, complaining of pain in the right side of the chest. Nothing of any note in the family history. The patient had measles when young; otherwise has been remarkably healthy. Denies excess in alcohol; admits gonorrhea, but has never had syphilis. His bowels have been regular; he has had no abdominal pains. The present illness began about a week ago, with headache, loss of appetite. He kept at work until two days ago, when the pain became very severe in the right side of the thorax, and was much aggravated by coughing and during a deep breath. He is positive that there was no chill, but he has had one
or two heavy sweats. For three days his bowels have been loose, and he has had from five to ten stools a day, but has not noticed any blood.

On admission temperature 104°. He is a large, well-built, well-nourished man; lies upon the left side. Lips and mucous membranes of a good color; the cheeks are flushed; tongue has a whitish fur. Pulse is 92, regular in force and rhythm; respirations shallow, 36. The thorax is well formed; the left side moves more than the right.

Percussion. Resonance normal on the left side. On the right side the patient winces on percussion below the fourth rib. The flatness begins at the upper border of the sixth rib in mammillary line. Behind, the resonance is defective at the right base and in the lower axillary region, and possibly there the line of dullness in front varies slightly with the position. The fremitus is diminished over the flat area.

Auscultation is everywhere clear in the left chest and in the upper part of the right, but in the flat area the respiratory and voice sounds are diminished in intensity, and in the lower mammary region there are a few dry râles. The condition of the heart is normal.

The abdomen is full; the walls are tense. There was no tenderness, no glandular enlargement, and the only point of special moment was the distinct increase in the size of the spleen, the edge of which could be easily felt at the costal margin. The blood was negative as regards the malarial plasmodia. There was marked leucocytosis—18,000 white corpuscles per c.cm.

The urine presented a trace of albumin, was dark amber-colored, acid; specific gravity 1020.

The patient had a slight cough, with a muco-purulent, slightly bloody expectoration, in which there were numerous cocci, some encapsulated. It was evident during the first week in the hospital that the patient was very ill. Every day the temperature rose to between 103° and 104°, occasionally reaching 105° and once 106°. The pulse range was from 100 to 120. He had at times heavy sweats, and on the 2nd of May he had two severe chills, in one of which the temperature rose to 106.2°. The dullness at the right base persisted, beginning in the back about the ninth rib, and in front in the recumbent posture at the fifth rib. There seemed very little doubt to Dr. Thayer, under whose care the case came, that there was pus in the pleura, and an aspirating needle was inserted, but without obtaining any pus.

During the second week the patient emaciated rapidly; the fever persisted until May the 8th, and then fell to normal, the range being between 97° and 99°. The spleen remained large; there were definite sweats, but he seemed altogether better. On the 9th the blood count showed a diminution in the number of leucocytes—13,000 per c.cm. The
temperature remained low, and patient seemed to be somewhat better until the 15th, when it rose to nearly 105°, and the pain in the side had been worse ever since he sat up with the bed-rest two days ago. Yesterday it became very intense. The physical signs have scarcely changed. There is still flatness from the fourth rib, and behind from just below the angle of the scapula. The apex beat of the heart can now be accurately localized, and is in the fourth interspace 1.5 cm. outside the nipple. The respiratory sounds are feeble and distant.

On the 16th the patient was again aspirated, and this time pus was found which was a little stained, and contained the staphylococci and micrococcus tetragenus. Shortly after the aspiration the patient was seized with a fit of coughing and began to expectorate a quantity of reddish-brown, anchovy-sauce-like sputa, which was examined for ameba, without finding any. It was then determined to transfer to the surgical side for operation. Before the transfer the following careful note was made: "The patient is propped up in bed; the right side of the chest seems a trifle fuller than the left, the upper part looking more nearly equal. Motion is defective in the lower right front. On the right side flatness begins in the upper sternal line in the third space, at the upper border of the fourth in the nipple line, and at the fourth space in the mid-axillary line. Posteriorly, flatness begins at the angle of the scapula. In the erect posture the upper limit of dullness in front appears to move slightly. On the right side the percussion is clear. Respirations are clear at the apex in front, but diminish greatly in intensity over the flat areas, and is of a distant tubular character. The voice sounds have a somewhat nasal quality. The vocal fremitus is only just perceptible. In the infra-scapular regions the inspiration has a more distinctly tubular character, and there is very distinct egophony. The liver does not appear enlarged downward, and the border is not palpable."

The case was thought to be probably empyema, though the possibility of an hepatic or sub-phrenic abscess had been considered.

The following is an abstract of the report on the operation by Dr. Halsted:

The eighth rib on the right side was exposed by an incision from the axillary line to the nipple line; a portion of the rib, 5 cm. in length, was excised. It was found that the costal and diaphragmatic pleural surfaces were adherent. An incision made through these and the diaphragm opened at once into a large sub-phrenic abscess, which was freely evacuated and packed with iodoform gauze. The patient reacted well from the operation, and made practically an uneventful recovery. The discharge of pus gradually diminished, and he had fever only on two days. He had a chill on the 30th of May, and on the 3rd of June, after which he had no
further fever. His weight rose from 129 to 156 pounds, and he was discharged August 15th with only a small sinus remaining.

Case V. Acute rheumatism; during convalescence signs of large empyema; operation; 100 c.c. clear serum in pleura; evacuation of large sub-phrenic abscess; recovery. Thomas F.M., aet. 14, schoolboy, admitted August 3rd, 1892, complaining of pain in the shoulders and in the stomach. His family history is good. He has had measles once, and diphtheria twice, but has been, until quite lately, healthy and strong. The present illness began three months ago with pain and swelling, at first in the ankles and knees, and subsequently in the hips and other joints. Evidently, from his account, he had a pretty sharp and somewhat protracted attack of acute rheumatism. He had been convalescent and doing very well until two weeks ago, when he had pain in the right side, cough, and slight expectoration. For at least two weeks he has had some shortness of breath, which lately has increased very much. He has had no diarrhea; the bowels have been regular, the appetite fair. He has had chilly feelings, but no definite rigors; has at times been feverish, and has sweated freely at night. He states that he has lost about twenty-five pounds since the beginning of his illness.

On admission the patient was emaciated, pale, propped up in bed, the pulse 124, regular; the temperature, 100°, rose within a few hours to 103°. The respirations were 28.

Thorax. Prominent on the right side, which does not move nearly so much as the left, and there is distinct bulging in the fourth and fifth right spaces under the nipple.

Percussion on the right side gives a somewhat tympanitic resonance in the infra-clavicular space, gradually shading into flatness at the fourth rib, the line of dullness extending through the lower axillary region to a point just above the angle of the scapula. In the erect posture the line of absolute flatness in front is distinctly higher. Tactile fremitus is absent in the flat regions. The respiratory sounds are everywhere clear except at these parts, where the respiratory murmur is scarcely audible. On the left side the physical examination is negative.

There is no expectoration. The apex beat is under the fifth rib in nipple line. The first sound is loud and sharp, and the second sound at the margin of the sternum was louder than the left. On palpation there was a suggestion of a thrill at the apex region, and there was a slight echo in diastole, but no definite murmur. The abdomen presents nothing special on inspection: the liver dullness extends three fingers' breadth below the costal margin. The border is not accurately palpable, owing to the contraction of the abdominal muscles. The edge of the spleen is not palpable. The patient remained in the medical wards for five days. The
temperature range was from 98° to 103.5°. He had no chills, some sweating; the pulse ranged from 110 to 130. On the 7th, pus was drawn off with an aspirating needle, and the patient was transferred to the surgical side with the diagnosis of empyema. The pus was creamy-looking, but no micro-organisms were found.

An operation was performed by Dr. Finney on August 11th. About 9 cm. of the ninth rib on the right side was excised. An aspirator needle was then passed through the thickened pleura, but seemed to enter a solid mass, and nothing was obtained. On a second attempt, 250 c.c. of pus were withdrawn. The pleura was then incised just above the diaphragm. No pus was found, but 100 c.c. of clear serum. The diaphragm presented at the wound. The pleural cavity was shut off as completely as possible with strips of gauze, and the diaphragm was incised with the Paquelin knife, opening into a large pus cavity with numerous pockets. About 100 c.c. of pus were evacuated. A rubber drainage tube was inserted into the cavity. The patient did remarkably well, and the temperature fell. He was dressed daily; the discharge was free, and he gained in weight, and left the hospital on September 9th, still with a slight sinus.
On Sporadic Cretinism in America.

BY

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FROM

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ON SPORADIC CRETINISM IN AMERICA.¹

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The studies which have given to the thyroid gland the dignity of an organ with diseases of capital importance have come from practising physicians, experimental physiologists, and from surgeons: studies which, "fitly joined together," have not only made clear some dark problems in pathology, but also have raised a reasonable hope in the treatment of a group of hitherto hopeless disorders.

A relation between myxedema proper and cretinism was hinted at by Gull in the title of his paper (1873) "On a Cretinoid State Supernovening in Adult Life in Women," and clearly appreciated by Ord, in 1877, in a fuller description of the disease, in which its connection with abnormal states of the thyroid gland was recognized. The remarkable cachexia found by the Swiss observers, Reverdin and Kocher, to follow certain cases of total extirpation of the thyroid, and the brilliant studies by which Horsley demonstrated the existence of an experimental myxedema, threw a flood of light on the whole subject, and enabled the committee of the Clinical Society of London, in 1888, to reach the following conclusions: "That there is strong evidence that myxedema, sporadic cretinism, endemic cretinism, cachexia strumipriva, and the operative myxedema of animals are severally species of one genus; that such clinical differences as exist between them are due to causes already sufficiently set forth; and that the one pathological fact common to all these conditions is the occurrence of morbid processes or of operations involving the annihilation of the function of the thyroid body."

Having had at my clinic within a comparatively short space of time three cases of cretinism, and knowing that the subject of myxedema was to be presented at this meeting, I thought the matter of sufficient interest to inquire as to the prevalence of the disease in this country. The report here made is based upon a careful search of the literature so far

¹ Read before the Association of American Physicians, May, 1893.
as it relates to the United States and Canada, and upon inquiries made of the superintendents of the Asylums for the Insane and of Institutions for Feeble-minded Children throughout the country, as well as of many friends.

As much misunderstanding exists as to the exact definition of a cretin, illustrated by the fact that at least one-half of the photographs sent me from different institutions did not belong to this type of idiocy, it may be well to define somewhat carefully the precise conditions to which this term should be applied. In the first place, there is no essential difference between the cases occurring in large numbers in goitrous districts and the sporadic cases. The term should be limited accurately to a form of idiocy associated with changes in or absence of the thyroid gland. The following statements are based upon the recent article of Horsley. The important factor is the loss of the function of the thyroid gland, whether this results from congenital defect, progressive atrophy, or coarse changes which gradually annul its function.

1. Congenital cretinism is rare, and is usually associated with absence of the thyroid gland. The child rarely lives, but the changes presented are sufficiently distinctive for diagnosis. The supra-clavicular fatty tumors are well marked and the skin generally is thick and in folds. The limbs are short, the epiphyses swollen, while the shafts are much ossified. The skull is broad and short, the sutures open, and the basisphenoid junction is prematurely ossified, a point upon which Virchow laid great stress. This congenital variety may be difficult to distinguish from rickets. Degenerative changes, slow over-growth of the fibrous tissue, and a myxœdematous condition have also been met with.

2. Ante-natal and subsequent slow development of cretinism. Here the changes appear to have been initiated during foetal life, but are slight and scarcely noticeable at birth. "The infant shows no, or very slight, signs of intelligence, but the physical signs are less obvious. According to some, the majority at birth have a goitre, usually of about an inch in diameter; the body is large, with disproportionate head and hands, and, what is more important still in connection with the similarity to myxœdema, in many cases the subcutaneous tissues appear œdematous; occasionally, according to the severity of the case, there is also non-development of the facial bones, a flattened nose, giving a stupid appearance, and a large thick tongue. The neck is short and thick. It is obvious that under these circumstances we have the same condition as that described above, only much less severe; the further history of these cases shows that the destruction of the thyroid gland continues, and the symptoms develop into the worst form of cretinism, about to be described." (Horsley.)

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3. Development of cretinism in early childhood. The infant may be perfectly normal at birth, develop naturally, and show no signs of disease until from the second to the fifth year. A majority of the instances of sporadic cretinism belong to this division. "The child from being bright and normal becomes gradually less and less intelligent, and at the same time the physical appearances which have been summed up in the conditions before mentioned begin to assert themselves. The child does not increase in height, the limbs similarly do not lengthen, but remain short and thick. The trunk is broad and thick, there being also well-marked lordosis, so that the abdomen is prominent. In like manner the neck is shortened, the skull broad, the nose retroussé, the lips thick, and the teeth very imperfectly developed. The speech, from being clear becomes thick, the voice is rough and at times stridulous, the physiognomy is placid to stupidity, the skin is coarse, the hair becomes scanty and thin. There is well-marked anaemia; the subcutaneous tissues have a peculiar kind of spongy or waxy feel, as if there were, so to speak, solid oedema occupying the connective fibres of the tissues.

"The condition thus produced reaches its height usually by the end of fourteen or fifteen years, so that by the twentieth or twenty-first year it has attained complete development, and thenceforward remains perfectly stationary until death. Hence, at the age of thirty the physical appearance presented is that of a young child, and the intellectual condition similarly does not advance beyond that of childhood." (Horsley.) A majority of the cases of which I shall speak and which are illustrated in this paper belong in this division.

The adult condition of cretinism as seen in cases which have developed slowly, and have reached the age between twenty or thirty and over, is very characteristic. This "pariah of Nature," as it has been called, is a being degenerate both physically and intellectually; short in stature and childish in appearance. The height usually does not exceed that of a child from five to seven years old. The skin is often rough, sometimes brown and stained, but in the sporadic cases more frequently of a chalky earthy hue. In certain instances the subcutaneous tissues are much infiltrated, so that the skin has a curiously waxy hue. Supra clavicular folds of a fatty and myxœdematous character are common. The hair may be thick, and is usually confined to the head, even in adults; but in some instances there are traces in the axillæ and on the pubes. The face has an aspect of dulness and stupidity, though sometimes in the sporadic cases it is bright and smiling. The lips are broad and thick and prominent; the nose is broad at the base; the nostrils wide; the alæ very broad and pass without any special division into the naso-labial fold. The eyes are widely separated and sometimes present strabismus. The eyelids are often oedematous. In
advanced cases, though they see things, yet they see without any intelligence, and the expression of the eyes adds very much to the impassive, immobile aspect. The tongue is often thick, large, and may constantly protrude from the mouth. The skull is large in proportion to the body and to the face. It is broad, brachycephalic, the transverse diameter approaching that of the antero-posterior. It is flattened in the forehead and frequently depressed and sloping backward. The two halves of the head are often asymmetrical. The sutures are often occupied by Wormian bones. The neck is large and short, and the thyroid gland may be enlarged or may be completely absent. The thorax is usually deformed in association with lateral or antero-posterior curvature of the spine. The abdomen is prominent and full. The limbs are extremely short, sometimes emaciated, occasionally deformed by rickets. The muscles are feeble, the hands and feet are large, the fingers thick and broad, and the nails often coarse and large, and may be rudimentary.

There are varying grades of cretinism, and just as we recognize complete idiocy, imbecility, and feeble-mindedness, so there have been described three degrees of this affection: cretins, which present in a most advanced degree the physical characteristics above mentioned, and are in addition deaf-mutes with the vegetative functions alone active; semi-cretins, with mental dulness, harsh guttural voice, expressionless countenance, and the physical condition similar to but less pronounced than that of the true cretin; and lastly, the cretinoid condition in which there is some degree of enfeeblement of the intelligence, speech somewhat impaired, and the physiognomy and physical conformation is that of the cretin.

The recognition of the condition of cretinism, though easy in advanced and typical cases, is often, I find, not clearly made: I judge this from the number of descriptive cases sent to me as instances of this condition, but which in reality have been cases of various forms of idiocy. The important criteria are the physiognomy, the shape of the head, the stunted growth, and the condition of the connective tissues. The mental deficiency is less characteristic, presenting nothing not seen in instances of ordinary idiocy. The condition of the thyroid is uncertain. There are cretins with and cretins without goitre, while in others the gland seems entirely absent. The most satisfactory diagnostic feature is the condition of the skin and connective tissues, which, as Horsley suggests in the following words, should form really the basis of the classification. "By excluding all cases in which the appearance of idiocy is not accompanied by any noteworthy changes in the skin or connective tissues we obtain a considerable delimitation of the condition which we ought to call cretinism, for by adopting such a plan of differentiation we necessarily leave out all cases due to direct injury or disease of the
central nervous system, and which are included in the conditions classed by various writers under different headings, such as congenital idiocy, idiocy following encephalitis, idiocy coupled with porencephaly, etc., all being cases where we have destructive lesions or non-development of the central nervous system, especially of the cerebral hemispheres, and in which, therefore, we have a simple and direct destruction of the intellectual mechanism. Although such conditions may be naturally accompanied by want of development in the parts of the body which may happen to be paralyzed, etc., still there is no direct or certainly no general change in the connective tissues throughout the whole system, and secondarily in the nervous system, such as furnishes the basis of the present classification."

The pathology of the disease requires to be studied in the light of the more recent researches. In endemic cretinism the thyroid gland is very commonly enlarged, but in all probability functionless, and the intimate relation of the condition to goitre, particularly the marked influence of heredity as shown in the fact that goitrous parents are more likely to have cretinous children, shows the close interdependence of cretinism upon conditions of the thyroid. In the sporadic cases the thyroid is usually absent, and in all probability the progressive changes in the connective tissues, including the bones, are associated in some way with the absence of the function of this gland.

Historical.—References to the existence of cretinism in America are found in Hirsch,¹ the Dictionnaire Encyclopédique des Sciences Médicales, the Nouveau Dictionnaire, in the Index-Catalogue of the Surgeon-General's Library, and in the Index Medicus. Hirsch states that "Cretinism does not appear to be at all common except at a few points in all this region; at any rate it is stated by Barton that cases of it are rarely met with in the United States. Brown speaks of its occurrence in the valleys of Vermont; in Kneeland’s account of the health of Massachusetts (for which State I have been able to learn nothing of the occurrence of goitre), it is stated that there are at least twelve hundred idiots and cretins in a population of about one million. Praslow has also observed somewhat frequent cases of cretinism among a tribe of Indians living near Cape Mendocino, in California, as well as among the Spaniards in the mountainous parts of Southern California." These statements of Hirsch pass current in various works; thus Bury, one of the latest writers on the subject, in the Cyclopaedia of the Diseases of Children,² says: "In North America cretinism is not common except at a few points, namely, in the valleys of Vermont, in Massachusetts, and in

¹ Handbook of Geographical and Histological Pathology, vol. ii. (New Sydenham Society’s translation).
³ Vol. ii., art. "Cretinism."
California." When we turn to the original sources for these statements, nearly all of which antedate 1850, we find, for example, the authority for the occurrence of the affection in Massachusetts the general statement of Kneeland,¹ that there are twelve hundred idiots and cretins in a population of one million. I can find no detailed observation in this article, and the term "cretin" was probably used in a loose way to indicate some variety of imbecility. So far as I can ascertain, the statements as to the existence of the disease in Vermont and New Hampshire rest on a paragraph in Buckminster Brown's article on cretins in Switzerland:² "Simpletons or idiots are to be met with in the valleys of Vermont, New Hampshire, or Scotland." There is no reference to cretinism in Dorr's³ account of the prevalence of goitre in the valleys of the Green Mountains. Trask, of Windsor, Vermont, speaking of the prevalence of goitre among the early settlers in the valley, says: "In most countries goitre is connected with a species of mental imbecility called cretinism; but in the United States, thanks to God, it is a mere corporeal affection."

Praslow's account of the occurrence of cretins in California I have not seen, but I have letters from several correspondents in that State who know nothing of its existence at present, while in the State Insane Asylum, at Stockton, Dr. Hoisholt tells me, there are only two cases.

Barton,⁴ whose essay on goitre, published in the year 1800, is one of the few systematic attempts to study the distribution of this disease in America, states: "I have heard of some cases of cretinism among the Indians inhabiting the neighborhood of Sandusky. But such cases are undoubtedly very rare in North America. This circumstance, as I have remarked, is well calculated to show that goitre and idiocy are not necessarily connected with each other."

Here and there one meets with the assertion that cretinism occurs in Lower Canada among the French, but I have not been able to trace the allusion to its source or to verify the fact of its existence. Some years ago I looked through two of the large institutions for children in Montreal, and the Longue Pointe Asylum, without finding any, and two cases supposed to be cretins, at Cacouna, proved to be remarkable rachitic dwarfs.

The more recent literature descriptive of cases is also very scanty. Jacobi, in the Hospital Gazette, N. Y., 1879, vol. v., described briefly a case, the first on record in this country—a child of eight years. Johnson's paper, in the Detroit Review of Medicine, January, 1873, contains no statements about cretinism in America.

¹ American Journal of the Medical Sciences, April, 1851.
² Ibid., 1847, ix. p. 111.
³ New York Medical Depository, x.
Last year two cases were reported; one by Lloyd,\textsuperscript{1} from the Philadelphia Hospital; the other by C. W. Townsend,\textsuperscript{2} of Boston. Huber, in the discussion on Townsend's case, stated that the disease was not very uncommon among the children "in the tenement districts of New York, owing to the influx of immigrants," but no definite data are available as to the facts of its prevalence.

**Endemic Goitre.**—Endemic cretinism occurs only in localities in which goitre prevails extensively, and the above observations, which have led in Europe to statements as to the prevalence of it here in endemic form, have been based in reality upon incidental references to, and studies upon, goitre, made for the most part in the early part of the century. So far as I can learn, the disease has not and does not occur endemically in this country. It may be interesting to note certain facts about goitre which I have gleaned in my inquiries, but which, however, refer to this malady only so far as it might be related to the existence of cretinism in a locality. Hirsch\textsuperscript{3} is again our chief authority as to its prevalence; and, as he remarks: "Our information on the endemic occurrence of goitre in North America belongs for the most part to the early years of this century and is very fragmentary." Barton's memoir already referred to, and the articles of W. Gibson\textsuperscript{4} and of Mease\textsuperscript{5} contain the most authentic information as to its prevalence, from which subsequent writers have drawn their information. Without entering into details which are available in Hirsch's work, it may be stated that goitre has been described as prevailing among the French Canadians along the Detroit River, and along the Richelieu River between St. John and Montreal; in the valleys of Vermont and New Hampshire; in the central parts of New York about the smaller lakes; in Central Pennsylvania; in the mountainous districts of Maryland, Virginia, and the Carolinas; and in Alabama. From a majority of these localities we have no recent observations. I have written to a number of physicians in the towns of New England mentioned by Dorr\textsuperscript{6} as very much affected, and so far have had only negative answers. Thus Dr. R. Clark, writing from Windsor, Vermont, one of the towns mentioned by the early writers, says that in the past fifty years he has not heard of its being very prevalent; and Dr. Emerson, who formerly practised at Chester, Vermont (a town one-half of the inhabitants of which were stated by Dorr [1806] to be subjects of goitre), writes that "During seven years' residence in Vermont I do not recall seeing more than three or four cases of goitre, and I do not think that it prevails to any

\textsuperscript{1} International Clinics, vol. ii., series 2.
\textsuperscript{2} Archives of Pediatrics, Nov. 1892.
\textsuperscript{3} Op. cit., p. 149.
\textsuperscript{4} The Philadelphia Journal of the Medical and Physical Sciences, vol. i., 1820.
\textsuperscript{5} American Medical Recorder, Philadelphia, 1818.
\textsuperscript{6} New York Medical Repository, 1806.
special extent." Dr. R. J. Preston, of the Southwestern Lunatic Asylum, Marion, Virginia, has very kindly made inquiries as to the existence of the disease in some of the southwestern counties of that State, in which, as stated in Gibson's Surgery, the disease formerly prevailed, and here, too, it seems to have almost disappeared. Dr. W. Taylor, of Talladega, Alabama, who is the authority quoted by Hirsch in support of the statement that there is a "good deal of it" in the northern counties of that State, writes (1893): "Since that time [1854] my views on the subject have been greatly modified. With a much larger population there are now really fewer cases of goitre to be found in Talladega and adjacent counties than in the earlier period of their history. . . . . The fact remains that there has been a great decrease in the prevalence of goitre during the past thirty years, and the percentage of cases will not surpass the average in other States and communities."

In the Province of Quebec cases of goitre are by no means rare, and in Montreal the disease is certainly more frequent in hospital practice than in Philadelphia or Baltimore. I have no information of any localities in which it could be said to be endemic, attacking a very large number of persons.

In the neighboring Province of Ontario, in the limestone regions at the end of Lake Ontario, the disease is very prevalent. In response to my inquiry about cretins, Dr. C. K. Clark, of the Kingston Asylum, mentions the extraordinary prevalence of the disease. Thus in an asylum population of about 600 there are 288 cases of goitre. He writes:

"The goitres are generally developed when the patients are admitted to the asylum, and it is rarely indeed that we see recent cases unless among the employés. After studying the subject carefully I have come to the conclusion that Eastern Ontario is a distinctly goitrous district, and I do not believe that outside practitioners have given the matter any attention. It is difficult to get accurate statistics even from asylums, and for this reason I have never published the returns sent in from nearly every hospital for the insane in America. A superintendent would answer my circular and state that his institution was without goitrous patients. I would go to his institution myself and probably find twenty or thirty goitres. The inference was plain, and when institutions side by side gave returns showing marked differences the inference was plainer still.

"Outside practitioners about Kingston have written nothing of interest in connection with the subject, but I find goitre prevalent even among the lower animals; most of the curs about the asylum have goitres, some of them so large that anyone can notice them. The tendency to this disease seems to run in certain strains, and the young of some families of dogs and horses are invariably goitrous. In two cases of human beings
goitres have proved fatal through pressure. At one time I was inclined to believe that mental disease might be the factor determining the presence of goitre in so many of our people, but am now convinced that this alone will not account for the condition of affairs at the Kingston Asylum. The goitres met with in the insane are almost invariably incurable, probably because of long standing. Those occurring in employés are easily cured by ordinary methods of treatment. With some there seems to be a hazy idea that people coming from about Loughboro Lake have goitre more frequently than others in this district. There is nothing to show that such is the case, and the disease seems to be common and widespread throughout Eastern Ontario.

There are no cases of cretinism in the Kingston Asylum.

Altogether, the evidence at command favors the view that in the regions of Virginia, Alabama, and Vermont in which goitre was formerly endemic, it is now very rare.

Endemic cretinism does not exist, we may say, in the United States or Canada, nor is it at all probable, from what we can learn, that it has ever existed. My inquiries have not extended to Mexico, nor, indeed to New Mexico, in which it is stated that both goitre and cretinism occur.

Sporadic Cretinism.—Independently altogether of the occurrence of endemic goitre, cases of cretinism are known to occur here and there in all civilized countries, and the inquiries which I have made in this country relate particularly to the existence of this form of the malady. Its rarity may be gathered from the fact that up to date, so far as I can ascertain, there have been but three cases put on record. My attention having been called to the subject by the appearance in rapid succession of three cases at the Johns Hopkins Hospital, I thought it would be of interest to the members of the Association, particularly in connection with the discussion upon myxedema, to ascertain somewhat more accurately the prevalence of the disorder. Accordingly I sent out letters to all the asylum superintendents in the United States and Canada, and to the various institutions for feeble-minded and idiotic children, asking information as to the existence of the disease. I wrote also to physicians practising in various localities in which it had been stated that goitre prevailed endemically. Among the replies which I received were descriptions of many cases of idiotic children which were evidently not cretins; but, in addition to the hospital cases I have referred to, there were eight well-characterized examples, the description of which will be given. In addition, from various superintendents there were statements as to the existence or occurrence of five or six other cases. The interest in the subject is at present a very practical one, inasmuch as the observations on the beneficial effects of thyroid feeding have been shown in several cases, particularly in those seen within the first three
or four years of life. I have at present two cases under treatment, but both for such a short time that it is impossible to say as to the changes in the condition.

CASE I.—M., aged (now) two years and three months, was brought to me first from the Eastern Shore of Maryland, January 10, 1892. The parents (first cousins) are healthy and strong. No hereditary ailments on either side; no members of the family have had goitre. The patient was the second child; the labor was easy, and she threw well. Nothing special was noticed about the child until the end of the first year, when it was suspected something might be wrong, as she had not cut her teeth, and did not attempt to walk or to talk. Throughout her second year she grew fairly well, but had several attacks of slight fever, and did not develop as other children, making no attempts to crawl or to walk, and seemed unnaturally quiet and dull. She did not cut the incisor teeth until she was nearly two years old. Within the past six months she has changed remarkably in color, has become very pale and waxy, and the face and limbs seem puffy and swollen. She has taken milk well, and has developed a little mentally; smiles, and attempts to repeat her own name when it is said, and has learned to say "mamma" and "papa."

*Present condition.* Under-sized child for her age. Aspect is very striking; color pale; face, very broad across; the mouth is open; tongue protrudes, and is evidently enlarged; the lips are full and heavy; the cheeks very large, almost pendulous; the hair is long and straight; the eyes are blue; the sclerotics very pale; the eyelids glossy and infiltrated. The forehead is large, not badly shaped; the head well formed, rather prominent behind; the anterior fontanelle is not quite closed. She looks good-tempered, but takes very little notice, and smiles in a feeble way. The facial aspect is that of a cretinoid idiot.

The muscles of the arms are feebly developed; the subcutaneous tissues are much infiltrated; the hands are swollen and glossy—not tense, and look oedematous, but the infiltration is firm, and only yields on prolonged pressure. The legs look large; the thighs present several folds; the skin looks glossy, and the subcutaneous tissues are much infiltrated. The skin over the dorsal portion of the feet is very glossy and tense, and on firm pressure pits with distinctness. The abdomen is distended and the superficial veins prominent. Palpation is negative; the edge of the liver is palpable about six cm. below the costal margin. The edge of the spleen is not palpable, nor does the organ appear to be enlarged. The thorax is well formed; no trace of rickety enlargement of the ends of the ribs; no evidences of rickets in the long bones. The apex-beat of the heart is just within the nipple line. There is a systolic murmur with the first sound, which is loud and intense at the pulmonary cartilage; the breath sounds are clear. There is no enlargement of the superficial lymphatic glands; the thyroid gland is not enlarged; the cricoid cartilage can be well felt, as can also the entire trachea as low as the sternum, and it can be taken between the two fingers quite plainly. Dr. Halsted thought he could feel the thyroid beneath the sternomastoid muscle. The percussion note on the first bone of the sternum is
clear. The examination of the blood showed a moderate increase of leuco-
cytes and some irregularity in the size of the red blood-corpuscles.

The condition was diagnosed as sporadic cretinism. As it was evident
that the blood condition of the child was very much below par, she was
ordered the syrup of the iodide of iron.

March 1, 1893. Patient brought again to-day. In the year and two months
which have elapsed since I saw the child she has improved remarkably. She
is now three-and-a-half years old. Her height is 75 cm. She looks more
intelligent, takes more notice, and the facial expression is decidedly brighter.
She tries to say a few words, and has begun to walk with a little assistance.
The most striking changes are the disappearance in great part of the anaemia
and lessening of the firm subcutaneous edema which was so marked a
feature. She still has a little infiltration about the eyelids and cheeks. The
limbs also look full, and they are firm. The skin is a little glossy over the
hands and feet. The tongue does not protrude so often from the mouth,
though when the face is in repose it is frequently seen protruding slightly.
The face looks broad and full, and the expression and aspect are still cretinoid;
Head is 51.5 cm. in circumference, the abdomen 54.5 cm. The neck is thick
and short, and presents a large tranverse fold of fat. The thyroid gland
is not palpable, and below the thyroid cartilage the trachea can be felt
with the greatest distinctness and grasped between the fingers down to the
sternum.

The favorable reports from cases of sporadic cretinism treated with the
thyroid extract encouraged us to try it in this case, and the child has been
taking the glycerin extract of the sheep's thyroid in an amount corresponding
to about a quarter of a gland in the twenty-four hours. No special change is
as yet noticed after nearly a month's treatment.

Case II.—Emma——, aged nineteen years; brought to the Johns Hopkins
Hospital by her mother, March 3, 1893. The family history is good; parents
are not blood relations; no thyroid enlargement; no history of mental
troubles. Patient is the second child; delivery was not instrumental; she was
healthy when born; fat and well; nursed for nearly a year, and it was not until
the end of this time that it was noticed that she was backward in development.
She did not seem to grow and thrive as other children, though she took her
food well, and was in other respects quite healthy. For several years it was
thought that she was completely idiotic, as, though she took notice and seemed
to know what was said to her, she did not walk or talk, but had to be held in
the lap, and the tongue was constantly protruded from the mouth. She did
not begin to cut her teeth until the third or fourth year. They decayed early
and rapidly, and her second dentition did not begin until she was past her
twelfth year. The anterior fontanelle did not close until after her eighth
year. She did not begin to walk until her twelfth year. She has never
learned to read or to write.

Present condition. Her height is three feet nine inches. She walks readily;
the feet are turned out a little, and there is a somewhat waddling, uncertain
gait, with the hands spread. The face has the characteristics of a cretin.
The expression is pleasant; she smiles brightly, and looks good natured, but
has a childish, somewhat silly expression. She sits quietly, as a rule, with
her mouth shut, but sometimes the tongue protrudes between the lips. The face is broad, and all the features thick and coarse. The nose is retroussé, the nasal orifices very apparent, and the alae thick, and measure across the margins fully 5 mm. in thickness. The lips are thick and full; the cheeks prominent, large, and broad. In the upper jaw the lateral incisors are absent; the central incisors are of fair size, the enamel much eroded; the canines are small, also with defective enamel. The premolars and molars are small and much decayed. In the lower jaw the teeth are all present, but they are irregular and show the same character of defect. The roof of the mouth is much vaulted, the palate is not defective. The forehead is full, a little prominent in front; the head is long; the occiput projects, and it is broad immediately behind the parietal eminences. The occipital arches are much developed, and there are thick ridge-like projections at the line of the squamo-parietal sutures. The circumference of the head is 54 ½ cm.; from the tip of one ear to the tip of the other, 27 cm.; from the occipital protuberance to the glabella, 38 cm. The ears are well formed.

The neck is 36 cm. in circumference. The thyroid gland is distinctly enlarged; the left lobe more than the right. The hands and arms are well formed; there is no enlargement of the epiphyses. She uses her fingers well, and can feed herself and pick up small objects, but the movements are somewhat clumsy, and she is unable to dress or undress herself. The legs are firm and strong; not bowed. The gait is as above mentioned; she falls easily, and, as her mother expressed it, has no elasticity. She is flat-footed. The knee-jerk seems slightly increased. The body looks squat and full; the thorax is capacious; the back shows a moderate antero-posterior curvature. The abdomen is large. Examination of the thoracic and abdominal organs negative.

She is well nourished, and the subcutaneous tissues are firm but do not pit, and there is no appearance like that of myxœdema; it is only in the thickness of the features that the condition is suggested.

She talks a great deal; the voice is high-pitched, very difficult to understand. Some words she speaks clearly, and she talks and behaves very much as a child of two or three years. She is easily amused; showed with great pleasure and childish joy a little new ring, and is very fond of pretty things. She has a very good musical ear; can sing several little songs. She is very good-hearted and generous, and always very anxious, if she has anything nice, that the servants, who are devoted to her, should share it. She is, however, self-willed, and does not like to be thwarted. She began to menstruate eighteen months ago.

CASE III. (Dr. Booker.)—Minnie R., white, aged three and one-half years, came to Johns Hopkins Hospital Dispensary November 25, 1892. She was born in Lebanon, Pa., and lived there until one year ago, when she was moved to Steelton, Md. Born in natural labor; mother had only three hard pains; was a fat, healthy child up to second summer; when one year old, had summer diarrhoea, about sixteen stools daily for a month; after that the bowels became regular, and the child improved for a short while, then began to waste again without anything to account for it. She had no cough, no fever. There appears to have been no growth and no improvement since the attack of diarrhoea at one year of age, excepting the slight improvement
which came on soon after the diarrhoea had been relieved, and lasted a short time. Parents are healthy, and no hereditary tendency. Mother has a younger child living and healthy; she never had a miscarriage. The child was brought to the dispensary on account of an almost constant crying, which had existed for three months. Appetite good; bowels regular; no fever; sleeps well.

Present condition. Child is thin, but not emaciated; is pale, with yellow tinge. Skin is dry, scaly, inelastic, in great folds, and appears much too large for the body. Numerous small lumps can be felt under the skin over the abdomen. Face has an idiotic or stupid expression; lips thick and coarse; tongue broad and thick, and protrudes a little between the open lips; child has only the four central incisor teeth, which are already decaying and nearly black. (The two lower incisors were cut in August, when one year of age, and just before the diarrhoea commenced. The following October was the time of slight improvement in the general nutrition of the child, and at this time the two upper incisors were cut; since then she has had no other teeth.) The nose is flat and broad; forehead low, and the head covered by thick, coarse, chestnut-colored hair. Strabismus in both eyes; fissures of the eyes very small. There is some enlargement in the neck in the region of the thyroid gland, but it is not certain that it is the thyroid. Also a thickening behind the sterno-cleido-mastoid over the clavicle. The limbs appear relatively short; they are thin, and the skin is very loose and in great folds over the limbs. Hands are large, spade-like, and the skin rough and in folds over the hands. Right wrist has been slightly œdematous for several days. Abdominal organs do not appear to be enlarged; spleen not felt. Lymphatic glands of body enlarged. Weight, twenty-seven pounds; length, 69 cm. Temperature, 98.4° in rectum. Child cannot walk nor talk; mother said it could say "mamma" and "papa," but the child does not look intelligent enough for that. Blood examination; normal amount of white elements, some of which contain pigment; crescents and cellular bodies found.

The child was under observation until February, 1892. She was treated with quinine and arsenic, and for a while appeared to improve; she was able to sit up, which was more than she could do when brought to the dispensary. When last seen at the dispensary, February 10, 1892, she had about lost what had been gained, and was pretty much as when we first saw her.

The mother said the child had got all its growth in the first year, up to the time it had the diarrhoea; that since then there appeared to have been absolutely no growth.

Case IV. (Dr. Rotch and Dr. Bullard.)—G. S., female; aged six years, American, parents not blood relations, not the subject of goitre. Does not speak; mental condition is much enfeebled. Circumference of the head is 46.5 cm.; measurement from occiput to roof of nose, 34.4 cm.; across the head from external meatus to external meatus, 29.3 cm. There is the general condition of infiltration like myxœdema of the skin. The thyroid gland is not to be felt. Circumference of thorax is 40 cm. The bones are somewhat enlarged about the epiphyses. The front teeth are good. (This case will be published in full by Dr. Rotch.)

Case V. (New York Custodial Asylum for Feeble-minded Women; Dr. Brownell.)—Sarah McG., aged nineteen years, American, parents temperate.
She is 86.5 cm. in height; weight, 41 pounds. The complexion is sallow; voice discordant, harsh. She sleeps well; is good-natured, and is seldom ailing; is a great favorite in the household. Largest girth of head, 52 cm.; from nose to occiput, 35.5 cm.; from ear to ear over vertex, 26.7 cm.; girth of neck, 29.3 cm.; girth of chest, 54.5 cm.; girth of abdomen at umbilicus.

**Fig. 1.**

**Fig. 2.**

Case V. Sarah McG., aged nineteen.

62.5 cm. The abdomen is protuberant and the chest is narrow; the legs are perfect, but the knees incline inward. The flesh of the hands and feet looks old and wrinkled; the teeth are a good deal decayed and notched. There seems to be complete atrophy of the thyroid gland; there is fulness in the supra-clavicular fossæ; there is marked curvature of the spine, both lateral and antero-posterior.

**Case VI.** (Indian School for Feeble-minded Children: Dr. Van Sweringen).—Louisa S., aged fourteen years, born in America, parents not related, no goitre in the family; nationality German. Height, 110.5 cm.; circumference of head, 56 cm.; from occiput to root of nose, 33 cm.; from external meatus to external meatus, 26.7 cm.; circumference of neck, 28 cm. The skin is loose and flabby, elastic and soft, very abundant. She is a deaf-mute, but appears quite intelligent. There is no curvature. The thorax is 57.3 cm., abdomen, 68.6 cm. The limbs seem a little enlarged about the
epiphyses. There is no goitre, and there is no trace to be felt of the thyroid gland.

**Case VII.** (Syracuse State Institution for Feeble-minded Children: Dr. Carson.)—Martha L. Y., aged sixteen years; parents Americans, not related. Height, 103 cm.; circumference of head, 54.7 cm.; measurement from occiput to root of nose, 32.5 cm.; across head from external meatus to external meatus, 34.4 cm.; circumference of neck, 34.4 cm. The subcutaneous tissues appear infiltrated and myxödematous, and there are tumor masses behind the sterno-mastoid muscle. The thyroid gland is apparently absent. The circumference of the thorax is 67.5 cm.; of the abdomen, 71.2 cm. The bones of the limbs are a little enlarged at the epiphyses. The teeth are defective. She is feeble-minded, but appears to understand what is said; can only say a few words; answers "yes" and "no." Is cleanly in habits; knows the names of objects, and can match colors.

Dr. Carson writes: "The child presents almost the characteristic features described in cretins by Dr. Down, namely: absence of the thyroid gland, puffy swellings in the supra-clavicular space; skin of an earthy color, loose, and flabby, as if too large for its body; the nose flattened; the distance between the eyes exaggerated; tongue large; lips thick; cranium brachycephalic. She speaks only a few words in monosyllables, and though occasionally stubborn, is usually of a placid disposition, laughs easily and heartily; is orderly and cleanly in her habits.

**Case VIII.** (State Insane Asylum, Stockton, Cal.: Dr. Hoisholt.)—Willie V., aged forty-two years; father was Irish, mother German; no note as to the presence of goitre. Height, 135 cm., circumference of head, 55.3 cm.; from occiput to root of nose, 35 cm.; from external meatus to external meatus, 33 cm.; circumference of neck, 38.4 cm. The skin is very loose, and in places hangs in large folds. The head is brachycephalic. The skin of the face in smiling is wrinkled. He is imbecile. The thyroid is not enlarged. There are no definite tumor masses above the clavicle; the spine is not curved. He is said to have been much brighter some years ago. The last three years he has had occasional epileptic fits.

**Case IX.** Johnny V., brother of the preceding case, aged forty years. Height 127 cm.; circumference of head, 58.5 cm.; from occiput to root of nose over the head, 29.5 cm.; from external meatus to external meatus, 38.3 cm. The skin is extremely loose; hangs in folds. On the scalp one may make a fold of four inches of superfluous skin; same on the neck, face, and back. The intelligence is very defective; speech scarcely intelligible; he is not at all bright, except that he has, under the circumstances, a remarkable memory for names, remembering those of from thirty to forty patients in the ward. The thyroid gland is not enlarged.

The photographs of these two patients show marked brachycephalic heads, wide nostrils, the eyes wide apart, and the condition of the skin described by Dr. Hoisholt appears to be fairly characteristic.

**Case X.** (Randall's Island Hospital, New York: Dr. Furness.)—Nellie R., aged fifteen years, born in New York State. Height, 76.3 cm.; circumference of head, 48.4 cm.; from occiput to root of nose, 30.5 cm.; from external meatus to external meatus, 31.2 cm. The skin is coarse and thick, and there are tumor masses above the clavicles. The thyroid is not enlarged. Circum-
ference of the thorax, 54.7 cm.; of abdomen, 51 cm.; it is distinctly pendulous. She can only stand with assistance. The epiphyses of the limbs seem somewhat enlarged. Intelligence is extremely slight, and she never talks, but can call the name of the nurse. She is affectionate in disposition, and on recognizing the Doctor utters a peculiar shrill cry.

The Doctor writes that the child looks about the age of three years; is unable to walk or to stand erect without support. The photograph illustrates a typical cretin.

Case XI. (Inmate of the California Home for Feeble-minded Children: Dr. A. E. Osborne.)—I. N., female, aged probably thirty-five years; nationality unknown, supposed to be Irish; no data about the parents. Height, 108 cm.; circumference of the head 56 cm.; measurement from occiput to root of nose, 35 cm.; circumference of neck, 38.3 cm.; circumference of thorax, 81.3 cm.; of abdomen, 84 cm. The face is broad and flattened; the skin rough, and hangs in folds over the body; the complexion is sallow; the hair very scanty and coarse; the teeth are defective, only half a dozen in the upper and lower jaws; no thyroid gland is palpable; the spine is slightly curved. The intelligence is of a low order, but her memory is good. The disposition is docile. She is tractable and affectionate, and forms strong attachments. She is quick to appreciate a favor, and has a fair sense of humor. The speech is slow and measured; the voice rather low and rasping. Respiration is slow, and the body temperature is below normal.

Operative Myxœdema.

In connection with the subject of myxœdema, I am indebted to Dr. McGraw, of Detroit, for photographs illustrating the following case, which, so far as I know, is as yet happily unique in American surgery—namely, one of operative myxœdema:

Case XII.—The patient, George M., is now about thirty years old, and was operated on March 7, 1881. Complete extirpation of the thyroid. The photograph [exhibited] was taken March 30, 1893. A full description of the case will be published by Dr. McGraw. Suffice it to say here that there has been a gradual but progressive change in this young man since the date of the operation. The hair is scanty and coarse; the skin thick and rough; the subcutaneous tissues very thick; the integument and underlying tissues make great ridges on the back and on the hands and feet. The intelligence is good, but the action of the intellect is slow, and he is unable to do any continuous work or to study. He complains of fullness in the head and ringing in the ears when he stoops. Even in standing he is not steady on his feet, and has a tendency to fall. Temperature is normal; pulse, 70; respirations, 20. Heart’s action is normal. Voice is harsh and squeaky.
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NOTES ON TUBERCULOSIS IN CHILDREN.

By WILLIAM OSLER, M.D.,
Professor of Medicine
at the Johns Hopkins University, Baltimore.

Read by title before the
AMERICAN PEDIATRIC SOCIETY,
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NOTES ON TUBERCULOSIS IN CHILDREN.*

BY WILLIAM OSLER, M.D.,

Professor of Medicine at the Johns Hopkins University, Baltimore.

I. WHAT IS THE INCIDENCE OF TUBERCULOSIS IN THE
FOUNDLING ASYLUMS AND CHILDREN'S HOSPITALS OF THIS COUNTRY?

In preparing the article on tuberculosis for Starr's
Handbook of Children's Diseases, I was surprised to find
how few observations had been made on the prevalence
of tuberculosis among the inmates of asylums and chil-
dren's hospitals in this country. Northrup's studies in
the New York Foundling Hospital show, as is well
known, a startling prevalence of the disease. We miss,
however, detailed statistics, the result of systematic
clinical and anatomical observations, such as have been
published during the past few years by our French and
German colleges. The most reliable figures, of course,
are those obtained in the post-mortem room. The mani-
festations are so protean that unless in fatal cases the
clinical be supplemented by an anatomical examination,
very many tuberculous lesions are overlooked.

The study would not only be interesting in itself, but
directly beneficial in improving the sanitary surround-

* Read by title before the American Pediatric Society, West Point,
N. Y., May, 1893.
ings of the institutions, promoting that scrupulous cleanliness, that aseptic environment, quite as important (though we are apt to forget it) to the physician as to the surgeon. Whatever stand we may take on the question of heredity, the fact is indisputable that in the tuberculosis of children the enemy in a large proportion of cases enters through the ever open portals of the respiratory and alimentary systems. As the surgeon with a case of streptococcus infection in his ward knows that there has been some focus of infection, so in these instances, when we find the bronchial nodes or the mesenteric glands the seat of advanced disease, we should recognize definitely air or food contamination.

Attached to every foundling asylum or children's hospital there should be a paid pathologist, who should report yearly to the Board of Managers and to the Medical Board on the prevalence of tuberculosis in the Institution. He, better than anyone, would be in a position to furnish data upon which important sanitary changes might be based. In every institution so equipped four or five years' work would not only throw important light on the prevalence of this scourge, but would also give indications as to the best means for its prevention.

II. THE FEVER OF TUBERCULOSIS.

The second point requiring study relates to the fever of tuberculosis. Usually, whether more or less continuous or definitely remittent, the fever is associated with active development of tubercles, their caseation, softening and suppuration, or with a peri-tuberculous pneumonia. The more definite hectic or intermittent type of fever in tuberculosis, with intermissions sometimes lasting for many hours of the twenty-four, is seen in children as in adults only in advanced cases of tuberculosis. In all these instances some definite relationship exists between the severity of the fever and the extent of the disease.

Our French colleagues have recently called attention to two other types of fever in tuberculosis which require
study. Several years ago Landouzy described a fever in
the tuberculosis of infants which sometimes was of such
severity as to kill before any extensive lesions had
developed. The children presented all the features of a
profound infection, but at the autopsy comparatively
trivial changes were found, either in the lungs or in the
glands. This *febris tuberculosis* *peracuta* (*fièvre infec-
teuse tuberculeuse suraiguë*) has been recently referred
to in the monograph of Aviragnet. The symptoms pre-
sented are those of a general infection rather than any
local disorder, and in the child it is described as coming
on insidiously, sometimes with vomiting; the tongue is
red, sometimes dry; the fever range is usually high; the
mental symptoms are marked, often a condition of pro-
found depression; the abdomen is distended, sometimes
painful; the liver and spleen are somewhat swollen. The
symptoms are, in fact, those of a profound infection
without definite local signs, and cases are described in
which the disease has run its course in children in a very
few days. The autopsy may show quite slight tubercu-
lous lesion, perhaps only in the bronchial glands or a
small area of tuberculous broncho-pneumonia, or the
disease may be connected with a group of enlarged
glands in the mesentery or the neck. The symptoms
are believed to be caused by the toxins developed in un-
usual amounts under certain favorable conditions at the
site of the local disease. I have never met with an in-
stance of the kind in children, but there was a case ad-
mitted to my wards on the 13th of March last, which I
believe to belong to this type. The patient, a man aged
forty-seven, had a swelling on the left side of the neck,
high fever and delirium. He had had an illness of four
or five weeks’ duration, and when admitted, the symp-
toms were those of a most profound infection without any
local disease to be discovered other than that of the
glands of the neck. Though his symptoms were highly
suggestive of typhoid fever, the swelling in the glands
of the neck seemed to be definitely tuberculous. He
died on the fifth day after admission. The autopsy
showed numerous punctiform haemorrhages. There was a chain of tuberculous glands, yellow and caseous, on the left side of the neck, evidently of some age. The lungs were crepitant, and there was an area of commencing pneumonia with fresh pleurisy over it in the right lower lobe. There were scattered miliary tubercles throughout the liver and the spleen.

To another form of fever attention has also been called by our French colleagues, the *typho-tuberculose*, or continuous tuberculous fever, acute fever developing in connection with a tuberculous infection, but which, unlike the acute miliary tuberculosis, runs a favorable course. Apparently it may be one of the first manifestations of the invasion of the organism by the bacilli, but it may be the expression of what may be called an aborted acute tuberculosis, consecutive to some local disease, and Landouzy refers to it as a bacillary toxæmia. The general symptoms are those really of typhoid fever, from which the diagnosis may be extremely difficult. It runs a course of from four to five weeks, and from the description and the temperature chart given by Avragnet there must be extreme difficulty in its recognition from typhoid fever. In fact, as he remarks, whenever we find a child with a *cortege* of symptoms sufficiently marked to make one think of typhoid fever, but not sufficiently characteristic to make a clear diagnosis, the question should always be raised as to the existence of tuberculosis. Shall we then recognize an acutely developing fever continuous in character, associated with tuberculosis and differing from acute miliary tuberculosis in running a favorable course?

III. GENERAL ANASARCA IN TUBERCULOSIS.

The following cases are of special interest from the fact that they were both admitted with general anasarca, the dropsy being due apparently to the blood condition rather than to any secondary nephritis associated with the tuberculosis.
CASE I.—General anasarca; albumin with hyaline and granular casts in the urine; cough; diffuse bronchitis; moderate fever; death on the fourth day. Tuberculous adenitis of the bronchial glands; tuberculous broncho-pneumonia; scattered miliary tubercles.

Edith J., aged three, colored, admitted November 29, 1889. She was brought to the dispensary, November 14, with a history of an illness from about the first week in September.

The nature of this was doubtful, as it was said to be malaria with pneumonia at one time, and at another diphtheria or scarlet fever. At the dispensary, when first seen, the child was wasted and looked very ill. The abdomen and legs were swollen; temperature, 101°. The percussion note over lungs was clear; numerous râles heard everywhere.

Dr. Booker, who first saw the child, diagnosed tuberculosis and sent the case to the ward. On admission the child was in a miserable condition with general anasarca; closed eyes from œdema of the lids, ulceration at the angle of mouth, and numerous erosions on the legs. The child coughed frequently, and there was a bloody discharge from the mouth.

The physical examination was not very satisfactory on account of great œdema of the chest walls, but râles were heard everywhere. The urine was scanty, acid in reaction, and contained albumin and numerous leucocytes with hyaline and granular casts. The temperature did not range above 101°. Although the case was admitted with the diagnosis of tuberculosis I must say we leaned rather to the opinion that it was acute nephritis (following either diphtheria or scarlet fever) with anasarca and extensive pulmonary œdema. The child lingered and died on the fourth day after admission.

Post-mortem by Dr. Welch. Body 75 cm. long; general anasarca. On the inner surface of thighs, numerous, irregular, more or less serpiginous erosions of the skin, from many of which a watery fluid escaped; similar erosions on the surface of the buttocks and one of these on the left, evidently of older date. On the left hand the two last digits of fourth finger and the last digit of the third were gangrenous.

Peritoneum contained 300 cm. of clear fluid; the membrane smooth and pale; pleural cavities contained small amount of slightly bloody serum. The heart was distended with fluid, blood and fresh clots; valves normal;
muscle substance pale, and fibres showed on microscopic examination extensive, diffuse, fatty degenerations.

Lungs.—Left; in the middle of lower lobe was an area of collapse and a few spots of ecchymosis. The upper lobe, dark-red in color and solid; and at the inferior margin and extending to the middle of the lobe is an area of solidification, which on section presented caseous areas surrounded by miliary nodules. The bronchial glands were large and caseous. The right lung presented a few pleural adhesions. On section the entire middle lobe filled with areas of grey tuberculous consolidations, in the centre of which was a small cavity containing pus. This was situated between the upper and middle lobes, and penetrated the tissues of each. Immediately below this cavity and adherent to it was a caseous bronchial gland.

Liver.—Large, pale and mottled with areas of intense congestion; the lymph glands of the hilus large and caseous. The kidneys were large, pale; capsules readily stripped off; cortices wide; striæ clear; microscopical examination showed intense fatty change of the tubules, particularly in those of the pyramids; slight degeneration in the vessels of the glomeruli and granular, fatty cells within Bowman’s capsules.

The Intestines.—Tuberculous ulcer in the ileum just at the orifice of the valve.

In Douglass’ fossa there was a caseous mass below the peritoneum.

Case II.—Primary tuberculosis of the intestines; diffuse tuberculosis; general anaasarca.

William L., colored, aged nine, admitted October 17, with general anaasarca. The father, one brother and one sister living; two died when quite young. The mother is dead; cause unknown.

The patient had whooping-cough some years ago; never has been ill since that time.

Six months ago the present illness began with pains in and gradual swelling of the abdomen; the appetite, however, remained good; bowels regular and he had no cough. He has gradually grown weaker and has lost in weight. It is not easy to get a satisfactory account of his illness from the friends. The condition of general oedema has, they say, existed for several months.

Present Condition.—Child is emaciated; eye-lids oedematous; face puffed; mucous membranes pale. The hands and wrists are swollen; the legs and feet are
edematous, and the abdomen is much swollen. Pulse is regular, the tension not increased.

Thorax.—The resonance is good in front and behind, except at the right base, where there is some flatness and slight movable dullness. The respiratory sounds are harsh and puerile, with occasional sonorous and sibilant râles. On the right side the breath sounds are distant, and become very feeble in the lower part of the chest. Cardiac impulse is in the third, fourth and fifth left spaces; point of maximum impulse apparently a little outside of the nipple line in the fifth interspace. The sounds are clear at the apex, with a soft systolic murmur in the pulmonary area, and the second sound is here accentuated.

The abdomen is much distended, soft and humid; no definite fluctuation, though there is slight movable dullness in the flanks. The border of the liver cannot be felt; nor is the spleen palpable.

The urine was 300 cc. in amount; sp. gr. 1013; acid; faint trace of albumin; no casts were found.

On the day after admission the child seemed bright in the morning; then suddenly became unconscious; the pulse was extremely feeble and could scarcely be counted, though the heart beats were loud and clear. About 11.30 the respirations became very slow, only seven to the minute, and extremely jerky, and he died about 12 A.M.

Autopsy.—(By Dr. Flexner.—Abstract.) Anatomical
diagnosis.—Primary tuberculosis of intestines secondary of mesenteric and rétro-peritoneal lymph glands; miliary tuberculosis of peritoneum, liver, pleura and lungs. Tuberculosis of bronchial glands; general anasarca.

Peritoneum contained several thousand cc. of chylous fluid. The left lung was firmly adherent. In the right pleural cavity there was a considerable quantity of clear fluid. The pericardium smooth.

Lungs.—Left costal pleura thickened and inherent. The lung is crepitant throughout, and in the upper lobe close to apex were two or three fresh-looking, wedge-shaped, hæmorrhagic areas surrounding minute tuberculous broncho-pneumatic cavities. In the right lung there were one or two small tuberculous areas at the apex. The bronchial glands were pigmented, and contained cheesy masses. There were one or two small superficial ulcers in the larynx.

The heart was normal. The liver contained numerous miliary tubercles. The kidneys were swollen, capsules
stripped off easily; substance firm, pale; the striae almost invisible; no tubercles.

Intestines.—“Fifty cm. below duodenum was an extensive and circling ulcer, the edges of which were undermined, the base irregular, worm-eaten, and contained necrotic grey and yellow material. It extended to the muscular coat, and the peritoneum over it was thick and opaque. At the mesenteric detachment there was considerable thickening and infiltration of the tissues. These girdle ulcers occurred at varying intervals throughout the small intestine, separated from each other by a few cm. There were in addition circular or oval smaller ulcers. On the peritoneal coat, corresponding to the ulcers, were numerous nodules of an opaque white and yellowish color. In the cæcum corresponding with the mesenteric detachment was a closely adherent tumor mass composed of caseous glands united by infiltrated fibrous tissues. The omentum was adherent over this mass, and when torn away the underlying tissue contained large and small tubercles. The cæcum itself presented an extensive deep ulcer, occupying almost the entire mucous membrane. The rest of the large intestine was healthy except the rectum, which presents a small ulcer.”

Peritoneum.—In addition to the nodules corresponding to the ulcers the peritoneum generally was sprinkled with tubercles varying in size from a pin’s head to a hemp seed. Between the liver and the diaphragm were masses of caseous tubercles and tuberculous granulation tissue, and tubercles were seen on corresponding points of the pleural surface of the diaphragm. The mesenteric glands were enormously enlarged and converted into caseous masses. The retro-peritoneal glands are also swollen and caseous.