

In ten days from first symptoms, child decidedly idiotic. Could not sit, stand or walk, even with much assistance. Pain over track of nerves, anesthesia most marked in the lower extremities. Patella reflex absent. On the fifteenth day very slight improvement, which gradually increased and the child was entirely well, with his usual intelligence thirty days later.

Case 8.—Charlie S., 4 years. Diphtheria September 1, moderately severe; treated with antitoxin; made a good recovery. October 5 child became sleepy, some regurgitation of fluids; two days later marked tenderness over track of nerves in the lower extremities; unable to stand alone or walk; four days after the first symptom of regurgitation, child unable to hold head up or sit alone; very marked tenderness over the track of the nerves in the lower extremity, to a less extent in the upper extremities; anesthesia marked over lower limbs, less over upper; in parts of chest and abdomen marked anesthesia; much muco-purulent discharge in mouth and throat; intelligence much diminished; the lungs showed signs of a general broncho-pneumonia, and very numerous pleuritic rales. The patella reflex entirely absent. The anesthesia and paralysis became marked, and death occurred on the ninth day from the first symptom of regurgitation and weakness.

Case 9.—Christine N., 6 years. January 6, mild attack of diphtheria, from which she apparently completely recovered. February 18, feverish and vomited; complained of much pain in both legs and was unable to walk; admitted to the New York Infirmary for Women and Children; absence of patella reflex on both sides; marked pain and tenderness over the track of the nerves, with very marked anesthesia to prick of pins and to the heat test; slight reaction to cold; upper limbs and trunk were normal; both feet extended; neither nasal voice or regurgitation of fluids; child not so bright as she is normally; can not stand alone nor take a step alone. Symptoms gradually decreased and child was well, with normal sensation and no paralysis March 27.

Case 10.—Nettie B., 9 years. February 29, eruption of chickenpox, which followed a normal course. Two weeks later child was taken out by an elder sister and complained of being too tired to walk; was out a long time and returned complaining of pain in both legs and inability to stand or walk alone. When seen the next morning there was marked tenderness over the track of the nerves, diminished patella reflex. The inability to walk increased; pain became more marked with noticeable anesthesia; nearly entire obliteration of patella reflex. Symptoms remained about the same; child could walk with great difficulty when supported. The disposition was extremely "cranky," the reverse of her normal condition. The upper extremities were at no time involved. At the end of three weeks the symptoms diminished in intensity, and gradual improvement took place. The child was perfectly well by May 15.

Case 11.—Rose B., 11 years. Entered the New York Infirmary, February 20, with a mild attack of chorea; by March 22 there had been little improvement in the symptoms and 5 minims Fowler's solution was ordered to be given every three hours day and night, a minim to be added each day. On March 29 she was taking 11 minims, when she vomited and the drug was discontinued for twenty-four hours. April 7, she was taking 119 minims, when a red papilla eruption was noticed, and symptoms of gastric catarrh, and the note was made that the arsenic had very little effect upon the chorea, so it was discontinued. April 13, the child seemed not to see and hear well. On the 19th very little twitching; May 2, no twitching. During this time the child had been disinclined to walk; had not seemed as intelligent as usual. May 12 the gait was very irregular and uncertain; dragged both legs; there was marked tenderness on pressure over the nerves; on the 21st utterly unable to stand alone, much pain over nerves, marked anesthesia in lower limbs. The symptoms of neuritis reached their height at this time and began slowly to disappear. June 4, began to walk a little with assistance; July 9 walking normally; no tenderness over the nerves; anesthesia had disappeared; discharged July 14, with no trace of either neuritis or chorea.

Several cases similar to Rose B. are found in medical literature, but the dose at the time of the development of the neuritis was smaller. This child received in the last twenty-four hours of the medication Fowler's solution $\frac{1}{3}$ iiss, or 1 $\frac{3}{5}$ gr. arsenious acid. One case is reported by Dr. Roberts, in which the child received 66 minims in twenty-four hours in three doses. In my case the symptoms of neuritis at first closely resembled those found at the end of chorea. The weakness and paralysis, with the anesthesia, appeared abruptly. The upper extremities were not

affected, but the trunk muscle seemed weak; the child could sit alone only for a few moments.

Case 12.—Anna J., 4 years. December 2, eruption of measles in the normal manner. December 3 the child refused to speak; seemed apathetic. A day or two later would smile and laugh without reason. Seven days after the first appearance of apathy the child could neither sit nor stand alone, cried when placed on her feet; marked tenderness over the track of the nerves in the lower extremities, with anesthesia. Between the third and the seventh day the symptoms gradually progressed and reached their height on the seventh day, remaining the same until the eleventh day, when she began to notice a little, and made her desires known by crying and pointing to objects, and attempted to stand but cried when placed on her feet. On the sixteenth day made an attempt to speak, but seemed unable to articulate; tried to walk on the nineteenth day, and was able to articulate; could stand alone and walk, but inordinately, on the twenty-second day; by the twenty-eighth day could speak distinctly, if not excited, put words into sentences, walked about but staggered some; pain over track of nerves and anesthesia nearly gone. Child walked normally at the end of six weeks; spoke as well as before illness at the end of three months.

In none of my cases were the sphincter muscles attacked. The family history in all cases was unimportant, except in the case of George N., whose parents are alcoholic, and Charlie S., whose mother died of tuberculosis during the child's attack of diphtheria. All the children except Nettie B., were tenement-house children. The sanitary surroundings of John K. were especially bad; the child lived in rooms into which daylight came in midsummer only from 10 A.M. to 3 P.M.

The differential diagnosis was made chiefly from Landry's paralysis, but in this the paralysis begins in the legs, spreading from one to the other, then to the upper extremities; in my cases the paralysis began in both legs at the same time. In the cases of diphtheria the nasal voice and regurgitation preceded the loss of power in the limbs; in none of my cases was there a question of poliomyelitis. The question of Friedrich's disease, I think, could be thought of only in the case of the child with measles, the only resemblance being the disturbance of speech. From myelitis the diagnosis was made from the symmetrically located pain, and no involvement of either bladder or rectum, and in each case the distinct history of a preceding infectious disease, except in the case of Annie P., in which the diagnosis of an infectious disease was uncertain, but with the first symptoms of inability to walk, was present the regurgitation of fluids and nasal voice, which are not found in myelitis. The treatment consisted of strychnin, either by the mouth or hyperdermatically; stimulants when indicated.

THE RECOGNITION AND TREATMENT OF EARLY MYXEDEMA IN CHILDHOOD.

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BY FREDERICK BIERHOFF, M.D.

Clinical Assistant, Department of Pediatrics, College of Physicians and Surgeons.
NEW YORK CITY.

That myxedema is not a disease *per se*, but a symptom, or collection of symptoms, dependent upon the absence, or upon a diseased condition of the thyroid gland, is now generally accepted to be a fact, the degree of severity of the symptoms depending upon the extent to which destruction of the secreting portion of the gland in question has taken place. That cretinism, myxedema and goiter (so-called) are but

variations of the one disease, is a view that is gaining adherents, as closer study into these conditions reveals the similarity in many of their symptoms, and the excellent results obtained in their treatment by the same therapeutic means. Sir William Gull¹ first defined myxedema as "a cretinoid state supervening in adult life in women," and drew attention to the similarity between myxedema and cretinism, expressing his opinion that both are allied. Ord² and others have also pointed out this similarity.

The accepted cause of the conditions is either absence of, or disease of, the thyroid gland. If the gland is congenitally absent, we get the condition known as true cretinism, either congenital or sporadic. When changes in the gland occur early, we have the cretinoid condition, or early myxedema; when these changes occur in persons who have attained full physical

trophic stage of a cirrhosis. Where this enlargement or hypertrophy is not general, we probably have to deal with a simple hypertrophy of the functioning portion of the gland consequent upon changes in another portion. Murray,⁴ in his excellent article on myxedema, says, in dwelling upon the differences between the varieties of myxedema: "In this connection it must be borne in mind that the actual size of the thyroid gland is not necessarily an indication of the amount of functional activity of which it is capable. A considerably enlarged gland may, from the nature of the structural enlargement, be just as incapable of carrying on its function as an atrophied gland." At the same time, the presence of a goiter does not of necessity presuppose myxedema, since that portion of the gland which remains may suffice in secretory power to continue the patient's normal



Sadie K.



Sadie K.

growth, we have myxedema. So much of value has been written of recent years in relation to the first and third divisions mentioned above, that it would be presumption on my part to add to or criticise; but in relation to the second, or type of early myxedema, it may be pardonable to present a few cases for consideration.

It was the occurrence of goiter in cases presenting some of the symptoms of myxedema, but in which growth had not been arrested, which first drew the writer's attention. In the adult, myxedema is nearly always found accompanied by a reduction in the size of the thyroid gland. Criminis,³ however, records a case in Thibet, in which the gland was enlarged. In the Clinical Society's report, in 59 cases of myxedema noted, 4 showed enlargement of the gland, and in 3 of 22 of the total number of cases, the gland had previously been enlarged. It is very probable that, in these cases of enlargement, without exophthalmus, we have to deal with a gland in the early or hyper-

health. Witness the fact that in some cases where goiter has been present from childhood, growth and the mental status have apparently not been interfered with, and the patient is, to all appearances, in perfectly normal health, but where the entire gland takes part in the process, the patient's health must suffer.

Having a change in the structure of the gland, we naturally get a change in the character, or quantity of the gland secretion, or both, and it is to this change that the symptoms of these allied conditions are due. Where the goitrous enlargement disappears under the use of thyroid extract or other preparation of this gland, it is very probable that, through the entrance of the active principle of the preparation—believed to be an organic iodine compound, discovered by Baumann and by him named thyroiodin—into the system, the deficit of this compound in the patient's economy is made up, an equilibrium is re-established, and the abnormal activity of the healthy portion of the gland ceasing, this decreases to the original size.

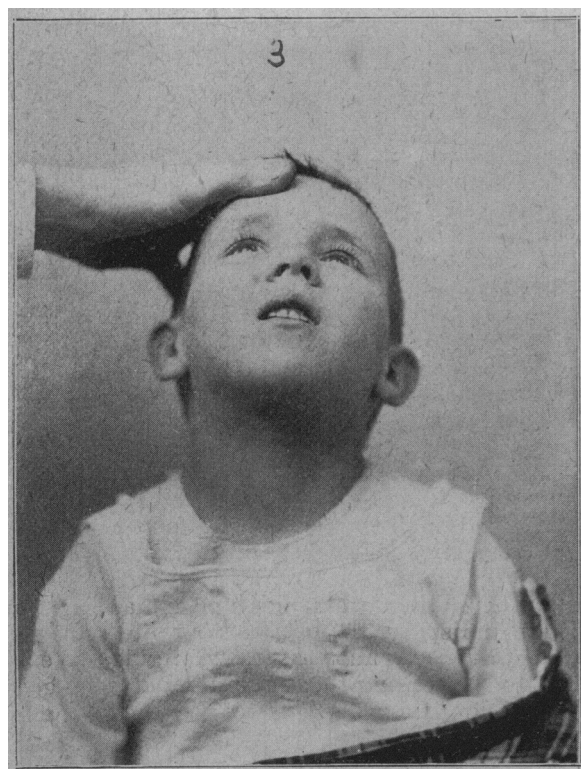
In view of these facts, I think we are justified in looking upon a spontaneous enlargement of the thyroid gland occurring in infancy or childhood, as being the precursor of more pronounced symptoms of myxedema, if allowed to go unheeded.

In this connection the following cases may prove of interest:

Case 1.—Sadie K., 8½ years. Both parents American. No tuberculous or specific disease on either side; maternal grandfather has a well-marked goiter which, he says, has been present as long as he can remember. (Patient first seen during the early part of January, 1897. Child presents a well-marked tumor over the anterior and antero-lateral aspects of the neck. Tumor first noticed two years ago, and has been growing slowly but steadily ever since. Tumor corresponds to the location of the thyroid gland, and measures, as nearly as can be determined, about 3½ inches horizontally, and about 2 inches vertically. (See Figs. 1 and 2.) The left side of the tumor (right of cut) gives a distinct sensation of fluctuation, presumably due to a cyst. The outline of the cystic portion shows the

single daily doses of three grains, after which its use was again interrupted. Within a month the gland began to enlarge again. The resumption of treatment was again followed by a prompt reduction in size. The same results occurred in each instance, upon interruption and resumption of treatment. At the present time, and for some months past, the patient has been receiving a single dose of ½ gr. every second day, and the gland and the general condition have remained normal.

Case 2.—Sylvester C., 11 years. Hungarian. Came under treatment during the summer of 1897, for a cough which had persisted for some months, accompanied at times by slight muco-purulent expectoration. Physical examination revealed signs of a mild tracheo-bronchitis. The thyroid gland was appreciably enlarged, although, owing to indistinctness of its outline, the exact measurements could not be obtained. On palpation, the enlargement was apparently uniform over the entire gland, and nowhere of a cystic nature. Inquiry revealed that the mother of the boy has had a goiter since childhood, but apparently enjoys good health. No family history of syphilis or tuberculosis obtainable, except that a paternal uncle died of phthisis. The tumor had first been noticed four years ago, and had grown slowly. No symptoms of mental change



Sadie K.



Sadie K.

left lobe and the isthmus to be involved. Over the right lobe the outline is less distinct, and the sensation that of a solid growth.

No pulsation over the tumor; no dilatation of the superficial vessels; no pressure symptoms; no apparent thickening, or scaling, or abnormal dryness of the skin. Hair coarse and dry; no falling out of hair has been noticed. Patellar reflexes unimpaired; no giddiness or headaches. It has, however, been noticed that the child's memory is somewhat impaired, in that she is beginning to forget her childish rhymes and songs. She is also less inclined to play with other children than formerly.

She was at first put upon the saturated solution of potassium iodid, in drop doses, t. i. d. This was continued for three weeks, with the result that the tumor became distinctly more tense and hard, but no smaller. January 26 the iodid was stopped, and the patient put upon a reliable preparation of thyroid extract, in tablet form, in doses of three grains, once daily for three days; after this in the same dose, twice daily, and then, after the same length of time, this was increased to three times daily, at which dose it was continued. Within two weeks a marked diminution in the size of the tumor was perceptible, preceded by softening over its entire surface. By the middle of the following April the tumor had entirely disappeared, and the child was to all appearances normal. (See Figs. 3 and 4.) For some months the extract was continued in

had been noticed. The use of thyroid extract was begun—in addition to a mild expectorant—in accordance with the plan outlined in Case 1, with the result that, after one week's treatment, the tumor had decidedly diminished in size. After three weeks the gland had returned to its normal size, and remained so until the case passed from under observation, some weeks later. This removal from treatment was reported to be due to the fact that the mother said that she had had a goiter from childhood without suffering, consequently she could see no reason for its treatment in the boy. The cough had disappeared entirely.

Case 3.—Mary McD., 14; Irish parentage. The child was brought for treatment August 2, 1897, because of habitual constipation, frequently accompanied by headache. Further questioning and examination, because of the typically myxedematous character of the skin of the face, elicited the following facts: History of the beginning of the condition is indefinite. The mouth and limbs twitch a good deal at times. Sleeps poorly; is dull and listless, sitting in an apathetic condition almost the entire time; does not care to play. Memory very poor. The child is of an affectionate disposition but rather timid. At times develops a destructive tendency, although this is not marked; this condition has, however, been more marked during the past year. At times complains of a pain in the cardiac region, and of shortness of breath. Speech is indistinct and

stuttering. Seems to grope for the words. Slight thyroid enlargement. The child began to menstruate when 9 years old, and this function continued quite regularly for two years. During the past three years, however, it has been entirely absent. Thickening and puffiness of the skin, especially of the trunk and face; teeth irregular and of Hutchinson type; slight anemia; hair dry and wiry. No especial loss of hair has been noticed, although the eyebrows and lashes are scant. Some drooping of lower eye-lids, and puffiness of the skin under the eyes. Slight internal strabismus, noticeable only at times. Heart-action rapid and somewhat feeble.

Since the change in the child's condition was first appreciated, it has been noticed that perspiration has lessened, until now it is practically absent, even in hot weather. At the beginning of the change she was in next to the highest class in the primary grade in one of our Public Schools. As the condition developed the child was gradually "put back" into lower classes until she was again in the lowest class. Her teachers then recommended her removal from school. The girl is the product of the third conception. The first terminated at the seventh, the second at the middle of the eighth month. In both instances the fetus was still-born. No direct history of specific disease in either parent is obtainable. Several other children in the family are apparently normal and healthy. Weight 68 lbs.

The diagnosis of myxedema accompanying congenital syphilis was made, and the treatment, as outlined in Case 1, begun.

September 15, a gradual improvement has been noticed since the beginning of treatment. Child acts brighter; wants to go out and play. First change noticed was that the child, of her own volition, seized a broom and swept the room. Now desires to help her mother with work, such as drying and washing dishes. Speaks far more plainly. Begins to spell and write again. September 22, at the end of the first week of treatment weighed 65½ lbs; now weighs 70 lbs. She again takes up her slate and has begun to play with her doll. Recalls some facts about her class and teacher. November 1, much brighter; wants to go to school; sleeps quietly at night now. Has begun to read in the "first reader." Has become sensitive to the taunts of her playmates. Not much lessening as yet in the thickening of the skin. Since the above the child has been kept steadily under observation and treatment. The mental condition has slowly but steadily improved. While still far from being a bright child, she is, compared with her former mental state, a different being. The general physical condition, too, is much improved, although there is still much thickening of the skin. The thyroid enlargement disappeared within the first month of treatment.

The only unpleasant effect of the extract noticed in any of the cases, was restlessness during sleep in Case 1, after the treatment had been in progress several weeks. Cessation in the use of the extract for a few days was quickly followed by the complete disappearance of the symptom.

I have chosen to class the above three cases together as variations in degree of the one condition, myxedema, for I believe that in those cases of goiter in which thyroid extract exerts a beneficial effect, by causing the disappearance of the enlargement, we have to deal with a condition of the gland, which may, if unchecked, go on to the development of a more pronounced form of this disease, as we see it in the adult, or of the cretinoid state, according to the age of the patient. Furthermore, I hold a trial of the thyroid extract, in cases of goiter without exophthalmos in children, to be fully justified. Bruns², of Tübingen, in speaking of the treatment of twelve cases of goiter gave as the result: Four children (ages 4 to 12), were cured completely. At the end of a fortnight there was a marked decrease observable in the size of the tumor, and in one month thereafter it had entirely disappeared. In one case of goiter, accompanied by a cyst in the thyroid, the goiter disappeared, but the cyst remained unaffected by the treatment. He gave one to two drams of the fresh thyroid gland inclosed in a wafer, or in a sandwich, once a week. His conclusion was that the treatment succeeds best in children. Herrick⁶ states that thyroid extract is of value

in simple hyperplastic struma, especially in the young. I am indebted to Prof. A. Jacobi and to Dr. F. Huber, his chief of clinic, for the privilege of reporting Cases 2 and 3.

139 West 126th St.

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NEURAL DYNAMICS.

Presented to the Section on Neurology and Medical Jurisprudence, at the Forty-ninth Annual Meeting of the American Medical Association, held at Denver, Colo., June 7-10, 1898.

BY W. J. HERDMAN, M.D., LL.D.

ANN ARBOR, MICH.

The learned author of our most recent work on the nervous system and its diseases has said: "Some knowledge of the dynamics of the nervous tissues is of fundamental importance to the student of nervous phenomena and nervous disease, who should know something of the stimuli to which nerve-cells and nerve fibers react; of the manner and degree of this reaction; of the phenomena by which it is attended and of the nature of molecular transmission." (Chas. K. Mills.)

Progress in clearing up the mysteries which attend especially the origin of functional disorders of the nervous system requires more complete and exact knowledge of neural dynamics. And as the organic changes are but the secondary stages of disorders which were necessarily functional in the beginning of the derangement, faulty dynamics must account for these also.

In the nervous system, exhibiting vital phenomena either of normal or abnormal nature, we have to deal with matter and motion: the same two elements which underlie all the phenomena of the physical universe. Right conceptions therefore of the nature and arrangement of the matter which constitutes nervous tissue and of the motions which act upon it and originate in it are indispensable to a correct interpretation of nerve action. Our knowledge is changing and enlarging daily concerning the structure and arrangement of the nervous tissues which constitute the machinery that serves to receive, transform and transmit the motion peculiar to it, and this added knowledge requires us to modify the conceptions we have previously entertained of the workings of that mechanism. It is but natural that the recent positive acquisitions to our knowledge of the minute structure of the nervous system have stimulated endeavors to explain by means of them many of the phenomena, both physiologic and pathologic, which are associated with nerve action, such as sleep, hypnotism, hysteria, epilepsy, etc., which have baffled all attempts at explanation and yet have for many reasons provoked perpetual inquiry. But it has seemed to me that all attempts at explanation that have come under my notice, even though they have called to their aid the evidences furnished by modern histologic research, have been too narrow in their conception and too limited in the range of elements considered as entering into the processes dealt with, to be of much profit in elucidating them. I refer especially to such suggestions made by several biologists and some neurologists as the one that the phenomena of mental action, hysteria, hypnotism, sleep, etc., may be accounted for by the mobility of the dendrites of the cortex neurons. Even if we should