which presented itself to my mind was the generation by irritation, in the digestive apparatus, of afferent impulses passing up the vagi, and resulting in pronounced cardiac inhibition, with peripheral anæmia. Professor Foster appears to regard the direct inhibition of the heart by vagus irritation as of like mechanism with the vascular dilatation which follows faradisation of a severed nerve such as the chorda tympani, and that, I presume, would establish a resemblance likewise with the heart of syncope, which one knows may result from emotional stimulation of the vagi. But the pupil of syncope is a dilated pupil, and seems to depend upon the general lowering of cerebro-spinal "tonicity," which results in vascular and muscular relaxation, and, when less extreme, in the disturbed metabolism and general atony of the neurasthenic invalid. In cases, therefore, in which we find syncopal states associated with a contracted pupil—a spasmodic, not paretic, condition of a muscle innervated by a cerebral nerve—and in which we can exclude narcotic poisoning, we must seek some other solution than that of a cerebro-spinal exhaustion. In the case of L. B.—, therefore, associated as it was with a contracted pupil and apparently blanched brain, it is probable that the anæmia in question and retarded heart were associated with reflex vascular spasm. As, moreover, the afferent impulses active in the production of this state presumably travelled up the pneumogastric nerves, the atropisation of the patient was calculated to remove this causal element. That it did so may, I think, be fairly argued.

It is not remarkable that the behaviour of a structure so visible and so sensitive as the pupil should have been a favourite study both of physiologists and physicians. References to the subject are common in the text-books and periodicals of both branches of the profession. The clinical value of this sign, however, in any particular case has to be very carefully weighed. It may be of little consequence, or it may be all-important, but with pupillary contraction or dilatation in relation to more localised disease we are not at present concerned. That the relation of the general vascular tone to the state of the pupil is a constant one will not, I presume, be questioned. Watching beside a dying patient I have seen the pupil dilate widely and permanently at the moment of death. On another occasion which has impressed itself upon my memory a patient who had suffered from severe tonsillitis for some days, and who had refused food, on my puncturing his tonsil with a bistoury, fell back on his bed apparently dead. His heart and respiration ceased, his muscular system became quite flaccid, and the signal for these grave phenomena was a sudden and permanent dilatation of both pupils. He was fortunately resuscitated by artificial respiration. When, therefore, one meets, in cases in which there is a widespread disorder of the nervous system, as in infantile convulsions, with a slow pulse and contracted pupil there is, I would suggest, sufficient reason to assume that we have to do, not with a cerebro-spinal syncope, but with a powerful reflex vascular spasm in the first instance, associated with retarded cardiac action and rise of blood-pressure. It is probable, however, that another factor in the condition is the state of the nerve elements in the central nervous system induced by the preceding conditions of original stimulus of a nerve or nerves, and consequent arrest or diminution of blood-supply to the affected centres. Beyond this point speculation would at present be unwarrantable, although it is to be hoped that the changes inducing a disturbance of sensibility, and which precede observable histological changes in nerve cells, may yet come within the sphere of knowledge. At present the existence of these states is notified only by the occurrence of so-called "functional disorders." On the other hand, whilst one may admit that it is theoretically conceivable that dilated pupils may in such cases be associated with vascular spasm—and Dr. West¹² says that the pupil is either immovably contracted or dilated during the fit—if a dilated condition of the pupil be accompanied by a quick and feeble heart's action, it will, I think, usually be found to be associated with a paretic and syncopal state.

That the heart may be accelerated from other than peripheral vascular causes is well known. In a paper on the Origin from the Spinal Cord of the Cervical and Upper Thoracic Sympathetic Fibres¹³ Mr. J. N. Langley has shown that the first and second thoracic nerves appear to be most potent on stimulation, both to dilate the pupil and to accelerate

the heart, and that such acceleration may be obtained independently of a rise in blood pressure. That some forms of emotion also act thus is a common experience; but that very want of language and intellectual activity which, as Dr. West¹⁴ and others have remarked, renders the diagnosis of disease in children at times so difficult, has this countervailing advantage that it excludes in a great measure the disturbing factors due to emotion, which, when present, render it difficult to estimate aright the cause of some symptoms and the effect of some drugs. This fact, I would submit, only imparts greater value to the cardiac state regarded as the key to the treatment of infantile convulsions.

Upper Berkeley-street, W.

SOME CASES OF SPORADIC CRETINISM, TREATED BY THE ADMINISTRATION OF THYROID EXTRACT.

BY WILLIAM WALLIS ORD, M.D. OXON.; M.R.C.P. LOND.,
ASSISTANT PHYSICIAN TO THE VICTORIA HOSPITAL FOR SICK
CHILDREN, CHELSEA; PHYSICIAN TO THE WEST-
END HOSPITAL FOR NERVOUS DISEASES.

THE following cases illustrate well the vast improvement, both physical and mental, that this form of treatment induces. It is well known that it exerts a rapid and remarkable effect in the allied condition of myxœdema, but the results in the case of sporadic cretinism are perhaps the more remarkable. In the former class of cases a function, either obsolete or in a state of abeyance, is recalled into activity; in the latter class that function is instituted afresh in cases in which it has never existed. Before giving the details of these cases I wish to make a few preliminary remarks. It was found to be impossible to make satisfactory collections of the urine for examination, the patients having no control over their sphincters previously to treatment; the estimations of urea, therefore, are founded on the average of the examinations of several specimens obtained at different times of the day. I regret to say that a systematic record of change of weight was not made in the earlier cases, but a general account of the changes in this respect will be found. No observations were made on the excretion of mucin, the treatment in these cases having been commenced prior to the publication of the results obtained by Dr. W. M. Ord and Mr. White. I now append the details of the cases:—

CASE 1.—This patient, a female, first came under my notice in November, 1890, at the Victoria Hospital for Sick Children, Chelsea. She then presented marked symptoms of cretinism. In March, 1892, Mr. Clutton implanted beneath her left pectoralis major muscle a small piece of fresh human thyroid gland, obtained from a case of parenchymatous enlargement of the thyroid, from which he had excised a portion. The child improved in nutrition for a time after the operation, but it was found that after the lapse of eight weeks the implanted gland was practically absorbed, and the improvement ceased. She was readmitted in February, 1893; her age was then six and a half years. There was no history of insanity in the family, and her parents were in no way related. She had never walked, but could move herself about the floor, though she did not crawl like an ordinary child. She was extraordinarily like a monkey in appearance. Her hair was scanty and ragged, and her neck was thick, with lumps above each clavicle. No thyroid gland could be felt. She was on the whole good-tempered, but subject to fits of passion. Her skin was dry and never perspired. She could barely stand with assistance. Her legs were bowed, in a manner suggestive of rickety deformity. There was also some enlargement of the wrists. (See Fig. 1.) Her intelligence was small, but she seemed to appreciate sweet foods, and to like to be noticed by visitors. The urine when collected was light in colour, of sp. gr. 1008, and contained no albumen. The average of several examinations showed that there was present 0.4 per cent. of urea. Her temperature was, on the whole, subnormal, but occasionally it rose to normal—never above it. She commenced her thyroid treatment on March 1st. At first she was fed on the raw gland, minced, pounded, and mixed with jam. She did not like this, and on March 15th she was given the prepared powder of thyroid, the equivalent

¹² Op. cit., p. 39.

¹³ Philosophical Transactions of the Royal Society, 1892.

¹⁴ Op. cit., p. 3.

of two-fifths of a gland being administered in the twenty-four hours. This treatment was continued for a fortnight, after which time she was given the compressed powder in the form of a tablet, each tablet containing five grains of the powdered extract. One of these she has continued to take daily up to the present time. She never seemed to experience any ill-effects from the administration of the extract, although she took large doses as compared with those given to adult patients. Her temperature in a few days rose to 99° F., but never went higher, and she had no vomiting or lassitude. On March 18th her urine contained 3.5 per cent. of urea, and on March 22nd 4 per cent. Physical improvement began to be manifested in about a week. The general nutrition began to improve, the skin became soft and moist, and the hair lost its harsh, dry feel. She did not make much progress in locomotion until she had been under treatment for about three months, when she began to stand alone. At the present time she can walk across the ward without assistance, her gait, however, being rather tottering and uncertain,

FIG. 1.

Before treatment.

due partly, no doubt, to the deformity of the legs. Her abdomen is still prominent, but Fig. 2 shows how she has improved in appearance and condition. The elongation of the neck is especially noticeable. When at play with the other children she talks to them and makes them understand her, but I have never been able to induce her to speak to me. She makes known her wants to the nurses, and her habits are much more cleanly than formerly. Her urine now contains 1.6 per cent. of urea. She is at present making a steady gain in weight, averaging half a pound per week.

CASE 2.—This patient, a male aged three years, was admitted to the Victoria Hospital for Sick Children, Chelsea, in February, 1893. He had been under observation since the previous August. He was born in Poplar, and his parents were both Londoners, there being no consanguinity between them. There were four other children, all living and healthy, but one child had died, aged five weeks, from spina bifida. It had webbed fingers. The patient had always been dull and

backward, and could not speak; he began to walk at the age of two years; he had always had frequency of micturition, and his general habits were dirty; he was a broad, dwarfed, bow-legged child, with a large protuberant abdomen and a thorax short and barrel-shaped, and his general condition was good; he had the usual facial appearance natural to the disease; his movements were slow and clumsy, and he often fell down. No thyroid could be felt, and there was no supra-clavicular enlargement; the skin was dry; the temperature was very slightly subnormal. The temper was variable, but, on the whole, he was good-natured. The urine was very pale and contained a slight mucous deposit; the total amount could not be obtained, but the average of specimens examined showed urea to be present in the proportion of 0.7 per cent. On Feb. 24th he commenced a diet of minced thyroid gland with jam, one-sixth of a gland being administered per diem. This was altered to the prepared thyroid powder on March 15th, and this again was replaced by thyroid tablets in a fortnight's time. These he has been

FIG. 2.

After treatment for six months.

taking daily ever since. On March 21st he was passing 2 per cent. of urea in his urine, the total quantity being collected. He left hospital on April 26th and has since been attending as an out-patient. His progress was more rapid than that of Case 1, possibly because he was younger, and also because his malady was less serious in character. He bore the treatment well, and his temperature never rose above 99° F. His mental and bodily powers increased rapidly, and from being dull and phlegmatic he developed a restlessness and a taste for exploration that rendered it difficult to keep him within bounds. His weight, which was 2st. at the commencement of treatment, fell on March 19th to 1st. 12lb. and on April 24th to 1st. 9lb., although his health was steadily improving all the time. Then it began to rise, and he now weighs 2st. 1½lb. He is growing rapidly, and, as will be seen in Fig. 4, in addition to facial improvement he has lost the distended abdomen. He can converse readily, and his mother declares that he is more intelligent than

other boys of his age. His urine now contains 2.8 per cent. of urea. He has quite lost his dirty habits.

CASE 3.—This was a male infant aged nine months, who was first seen on March 4th, 1893. He was brought to the Victoria Hospital for Sick Children, Chelsea, on account of his tongue, which was increasing rapidly in size and interfering with his power of taking food. He was of a typically cretinoid appearance, the facial and bodily conformation being well marked. The tongue protruded about half an inch beyond the lips and almost filled the buccal cavity. It was slightly bifid in appearance, and there was a constant flow of saliva. The family history showed nothing that could bear upon the case. There was no thyroid gland to be felt, and there were marked supra-clavicular swellings. No urine could be obtained. The child remained under treatment in hospital for a week, and then, owing to an outbreak of infectious disease, became an out-patient. He was treated with one tablet of compressed thyroid powder (five grains) daily, and under this treatment there was a slight rise of temperature, averaging about 99° F., but there were no other symptoms. The tongue regained its

FIG. 3.

Before treatment.

normal dimensions in a fortnight from the commencement of treatment. The child soon improved in general nutrition, grew rapidly, and began to exhibit signs of incipient intelligence. Unfortunately he succumbed to an attack of diphtheria in August, and owing to this and to his short stay in hospital there is no photographic record of his case. His improvement, however, seemed, if anything, to be more rapid than that of any of the other cases.

CASE 4.—A male child aged nine years and a half was admitted into the Victoria Hospital for Sick Children, Chelsea, on May 25th, 1893. His father and mother were first cousins. There were three other children, who were healthy. Before he was two years old his parents noticed that he did not progress as other children did, and as he grew older his "backwardness" appeared to be more marked. In the summer of 1891 he was brought to Mr. Clutton on account of a deformity of his back, supposed to be due to caries. Mr. Clutton, however, recognised the condition, and concluded that the curvature was a part of the disease. He ordered him a support for the head, as the weight of the

latter appeared to increase the deformity, owing to the weakness of the spinal muscles. He had been wearing this support ever since, and his parents said that he had been greatly benefited by its use. When admitted on this occasion he presented the typical appearance of a cretin; his intelligence, however, was much in advance of that of the average case. He knew his letters, he could converse reasonably, played with toys with evident pleasure, and seemed to have a good idea of the size and shape of things. He could walk and run, and seemed to prefer being in motion to being at rest. His temper was capricious, but in place of the usual bursts of anger he was affected with fits of despondency, during which his appetite, which was naturally fickle, appeared to fail him completely. He was 34 in. in height. There was a very marked antero-posterior curve of the spine at the junction of the cervical and dorsal segments. The curve was rounded and in no way angular. The vertebrae from the fourth cervical to the eighth dorsal were bowed backwards, and the lumbar spine was bowed forwards in a corresponding manner. This deformity did not appear to be due either to caries or rickets.

FIG. 4

After treatment for four months

Dr. J. S. Bury of Manchester, in his article on Cretinism in "Keating's Cyclopædia," describes this condition in the following words: "In cases seen by the writer the lower cervical and upper dorsal vertebrae formed a rounded prominence behind, while the lumbar region presented a deep concavity as if dragged forward by the enlarged and protuberant abdomen." The legs were bowed, and the feet and hands were large. The hair was scanty, the skin dry and rough, and the nails were thick and coarse. No thyroid gland was to be felt, and there were no supra-clavicular enlargements. The urine was clear, of sp. gr. 1012, light-coloured, and contained no albumen. There was on the average 4.4 per cent. of urea. The temperature was, on the whole, slightly above normal. He commenced to take the thyroid tablets on June 8th, taking daily one tablet of compressed thyroid extract, being equal to one-sixth of a gland. This treatment he has continued up to the present time. His temperature was slightly higher on the whole after the commencement of treatment. It rose on June 18th to 104° F., owing to an attack of tonsillitis. His weight at the commencement of the treatment was 2 st. 5 lb.

His general health was good, and his appetite improved, but he steadily lost weight. This continued for some time, his weight on Aug. 15th being but 2st. He has always been a very difficult child to feed, and during the hot weather in August last he could hardly be induced to take any nourishment. Thinking that the treatment might have something to do with this, I discontinued giving the extract for a week, but this seemed only to make him weaker in body and extremely depressed in spirits. Since the weather became cooler he has improved; his appetite is better, and his weight is 2st. 3½lb. In his case the improvement was less remarkable than in the others. His condition, especially mentally, was not nearly so serious, and he has hardly yet begun to feel the bodily benefit, which appears late in the treatment, and which I shall notice below. He was passing in his urine in the second week of October 24 per cent. of urea. His height now is 35½ in., being a gain of 1½ in. in less than four months. This is no doubt due in part to the fact that his deformity has been treated by massage and suspension.

Remarks.—In reviewing these cases there are certain points that present themselves for consideration. In the first place, the absence of symptoms of discomfort due to the treatment, such as are usually noticed in myxœdema, must be observed. The doses given were quite equal to those given to adults, and beyond a very slight rise of temperature no perceptible discomfort was apparent. Symptoms of improvement, however, did not occur so soon as in cases of myxœdema, no change of any importance being noted in the first week. It will be seen that in three of the cases there was a marked decrease in weight at first, this being accompanied by a decided decrease in bulk. After a time, however, the weight showed a progressive increase, due, apparently, to a deposit of adipose and other healthy tissues. Whether the decrease was accompanied by a marked excretion of mucin in the urine could, as I observed above, not be demonstrated; probably, however, this was so. With regard to the excretion of urea, in Cases 1 and 2 this was decidedly increased under the treatment. In Case 4 the percentage before treatment was largely above the normal, and subsequently diminished. I could find no explanation for this phenomenon. The rate of improvement seemed to have a definite relation with the age at which the treatment was commenced, being most marked in the youngest (Case 3) and least marked in the oldest (Case 4). Cases 1 and 4 developed, under treatment, profuse sweating of the head, accompanied by a disagreeable odour, almost faecal in character. It may be noted that three of the four cases were males. The engravings are from photographs.

Queen-street, Mayfair, W.

A CASE OF SPORADIC CRETINISM IN AN INFANT; TREATMENT BY THYROID EXTRACT.

By A. GORDON PATERSON, M.A., M.D. EDIN.

IN view of the great benefits derived by myxœdematous patients from treatment by thyroid extract, in whatever way administered, the following case of a sporadic cretin infant and the results obtained therein from the thyroid extract may be of interest as indicating a possible plan by means of which the condition of the unfortunate victims of the disease may be greatly ameliorated if not cured.

A male infant first came under my observation when eleven months old. The parents were healthy young people, being both sober and hard-working; there was no consanguinity between them. I could not discover, after most careful investigation, any trace of disease in either of the parents' families or in any of the collateral branches. The child was breast-fed till he was seven months old, when he was fed by the bottle. He was brought to me on account of obstinate constipation and non-closure of the fontanelles. At seven months it was noticed that the bowels were very confined and that simple remedies had lost their effect. It was also thought that he was backward. At nineteen months his condition was practically the same, with the exception that he had grown a little. The general condition of the infant at eleven months of age was as follows: There were no signs whatever of teething. He had never suffered from diarrhoea; he had not had convulsions or any febrile disease. His height and weight were not recorded, but at nineteen months his height was 25 in.

The head was large and the anterior fontanelles were very open, the division of the frontal bone being easily felt. The occipito-parietal junctions were very open, and on the right side there was a triangular space devoid of bone; all the sutures were very wide apart. The hair, which was brown in colour with a reddish tint here and there, was very scanty, fine, and short. The scalp was covered with branny scurf. The face was of a dirty yellow colour, with no blush on the cheeks or nose. The eyelids were reddish and the veins distinct. He suffered from ciliary blepharitis occasionally. His nose was a short pug, and very broad and flat at the root; the cheeks were thick and pale; the mouth was open; the tongue was very large and always protruding; the ears were moderate in size, but waxy; the neck was thick and short. The sterno-thyroids were very distinct; no thyroid gland could be felt, but there was a slight swelling over the right clavicle; there were no pseudo-lipomata. The abdomen was barrel-shaped and very tense, the veins being very distinct; it was, like the whole body of the child, very bluish and mottled. There was a small umbilical hernia of the size of a hazel-nut. The limbs were hard, swollen, stumpy, and very cold and purplish. The mottling was most marked from the elbows to the finger tips, and similarly in the legs from the knees to the toes. The hands and feet were remarkably thick and swollen with firm œdema, and they were very cold. There was a slight anterior curvature of the tibiae, otherwise no signs of rickets were present; there was no beading of the ribs. The spine was kyphotic. There were no fatty growths or hairy growth between the scapulae. The skin was always dry and harsh. There were no moles, warts, naevi, eczema, or ichthyosis. The secretion of sweat was almost entirely absent; saliva was abundant, but there was no nasal secretion. The muscular development was apparently absent, but this was due evidently to the thickening of the limbs, as shown by the results after treatment. The reflexes were normal as far as could be judged, but it was difficult to be certain. The skin sensibility was fair; the sight and hearing were good. The left testicle was quite down, but the right was not yet in the scrotum. The rectal temperature was 97.2° F. The child was extremely susceptible to cold and liked to be always placed near the fire. The voice was harsh and thick when crying, for he could not say a word and hardly made a sound. As regards mental development, spontaneity was absolutely absent. There was no intelligence. The sleep was variable. The child was very anæmic; the appetite was good; the bowels were very constipated and the motions pale; the liver and spleen were not enlarged; the urine was a clear yellow; the heart was normal, but the pulse was very feeble; the respiration was noisy, but regular; there were no enlarged lymph glands. The only differences noticeable between the condition at eleven months and nineteen months were as follows: The anterior fontanelle was still very open, but the left parieto-occipital was closed, and in the right a Wormian bone could be felt; the sutures were closing up; the hair was more abundant; the redness and veins of the eyelids had disappeared. The veins of the abdomen were mostly gone, and the mottling and tenseness were less; the umbilical hernia was smaller. The muscular power was improving, but he could not yet sit up and could only just move the limbs. The rectal temperature was 96°; in the groin it was 95.8°. The mental development was improving, as he could put out the hand and place the teat of the bottle in his mouth. He now recognised his father and mother, and occasionally smiled to them. He could drink only while lying down and from the bottle, as all the fluid escaped when he was sitting up, owing to the size of the tongue. These, briefly, were the chief points noticed when the thyroid treatment was begun. This consisted in the administration once daily of ten drops of the extract, plain.

I will now shortly note his condition after five months' thyroid treatment. After the third dose of the extract it was noticed that the face seemed to be smaller; the tongue was perceptibly more in the mouth, the hands were softer, and spontaneous action was greater, as was shown by his rubbing his eyes and grasping anything held towards him, which result was undoubtedly due to the softening of the arms allowing of motion. After the fourth dose he had a bad cold, and the extract was discontinued, but as symptoms of bronchitis threatened it was resumed, and, curiously, the next day the whole of the catarrhal and febrile symptoms disappeared. After the sixth dose the tongue had become, though still very large, quite flat, and was wholly within the mouth, and when he cried the cavity of the mouth and throat could easily be seen, which was an impossibility before. The