But if the ligature should drop off or fail to occlude the vessel, he then recommends ligating it with a needle and thread. The needle he employed for this purpose was straight, and for this reason he was obliged to pass it through the skin in the part of the stump nearest to the vessel to be secured; but what is most remarkable he recommends the use of a curved needle for sewing up deep wounds (Figs. 1 and 2).

His invention of ligating with the needle he imputes to the favor of Providence, for he says that he never saw it practised by others nor had ever heard of it, except that in a passage from Galen he had read that there was no speedier manner for arresting hemorrhage in fresh wounds than to tie up the vessels at their roots, which doctrine he considered applicable to vessels severed in amputation.

(To be continued.)

CRETINISM.¹

BY CHARLES S. MILLET, M.D., BROCKTON, MASS.

OSLER defines cretinism as a "chronic disease of nutrition due to loss or impairment of function of the thyroid gland. It causes a retardation of development of the central nervous system, leading to a retention of an infantile state, and to an extraordinary disproportion between the different parts of the body."

In its endemic form this disease has been known to exist since the Christian Era began; Strabo, Pliny the Elder and Juvenal all speak of goitre—the handmaid of cretinism—as being prevalent among the inhabitants of the Alps. But it is only about 25 years since sporadic cretinism was so carefully described by Sir William Gull, that his name is sometimes attached to the adult form of the disease. Following him, Ord, Kocher and the Reverdins did much; but the physiologists—particularly Schiff, Horsley and Von Eiselsberg—made possible the successful treatment of myxedema and cretinism by their scientific work in vivisection.

The extent to which this disease is endemic in certain parts of Europe is astonishing, and it has attracted so much attention that diligent and persevering inquiry has been made by distinguished scientific and medical men; the subject has also been studied by commissioners appointed by the governments of Sardinia, France, Austria and Switzerland.

In the eastern part of France there are as many as 32 cretins per thousand, and 111 cases of goitre per thousand. In the whole of France over 125,000 cretins and idiots are believed to exist. On the other side of the Alps—in Switzerland and in Austria—the number is fully as great. Contrast this statement with the fact that less than 100 cases of the sporadic disease are all that have been reported in North America!

¹ Read before the Massachusetts Medical Society, June 11, 1901, as a part of the general topic, "The Diseases of Nutrition of Infants."

The knowledge which we possess of the function of the thyroid gland is of comparatively recent date. That it had any important work to perform was considered very unlikely; some thought that it was simply a pad to protect the trachea and fill out the contour of the neck; and others thought that it acted as a kind of safety-valve to the vessels feeding the brain. The importance of the organ to life and death was first clearly demonstrated by Schiff in 1884, when he found that the removal of the thyroid gland in dogs was almost invariably followed by profound illness and death.

Further experiments on other animals brought to light the fact that the accessory bodies, which sometimes number as many as 4, differ both in structure and function from the gland itself. The physiological difference is yet to be determined, but it has been settled beyond dispute that the removal of the thyroid gland, without the extirpation of the parathyroids,—while it produces cretinoid symptoms,—does not cause death, more or less suddenly, as is the case when the latter are also taken out.

The endemic form generally occurs in mountainous regions and in the valleys between the mountains. The idea has long existed that the drinking water in these places alone contained the organic poison, but at the present time it is believed to be also air-borne.

So-called "goitre springs" are not uncommon in Germany, and Klebs found in one of them an infusoria which he thought caused goitre and endemic cretinism; but other observers have not been able to substantiate his experiments. All agree, however, that the disease in question must have a bacterial origin.

The only essential point wherein the endemic differs from the sporadic type, is that a goitre is much more apt to be present in the former.

Myxedema—as is well known—is the name given to the same disease in adults, and exophthalmic goitre is their antonym. Several cases are on record where the symptoms of the latter disease have been followed by, or have changed into, those of the cretinoid state; and when the thyroid gland has been removed in an attempt to cure Graves' disease, myxedema has occasionally been the result.

The disease may vary much in intensity, but even in the slight or early form diagnosis is never difficult if all the symptoms of abnormal development are carefully considered. Cretinism is quite unusual in that the physical signs are far more noticeable than the symptoms. It may occur in utero, but generally the first signs of trouble are not visible until the child is 5 or 6 months of age, and more often he is 3 or 4 years old before it manifests itself.

When the symptoms first become prominent, it is noticed that the child does not grow so rapidly as it should, that it is not so bright mentally, and that its tongue is too large for its mouth and lolls out between the teeth; the skin over the whole body begins to appear thick, swollen, dry and

scaly, instead of soft and pink; but it does not pit on pressure, or have the glossy, lardaceous appearance that is seen in Bright's disease. Virchow expressed it quite tersely when he said the skin was too big for the body; it certainly appears so, for it is prone to hang in folds, and even the forehead is sometimes pendulent, and the chin dew-lapped. The hair is thin and coarse, and in older children it frequently is not present in the axillæ or over the pubes. The child's face has a decidedly aged appearance, and the eyelids are often swollen so that only a narrow slit shows where the eyes are located. The nose is depressed between the eyes, and the alæ nasi are thick; thus making it seem still more flat from the great width of the nostrils exteriorly. The ears are also thickened and stand out from the head. The teeth are irregular, ragged and decayed; they are very late in coming, and the second set often never comes, or if present, the teeth are abnormally large and deformed. The abdomen protrudes, and there is generally an umbilical hernia. The back is arched, and curvature of the spine is also frequently a result.

The growth of the child is stunted on account of the limbs being abnormally short, and the hands and feet are undeveloped; the fingers and toes are immobile, and stand apart as a result of the morbid condition of the skin. The nails are short, brittle and striated, and dull in color. The child is distinctly pale, because anemia is always present, although the cheeks may be slightly reddened. The fontanelles commonly do not close for a long time. The muscles are weak; the head droops—sometimes so much that the chin rests on the chest.

Goitre, which is so common in the endemic disease, is only occasionally present in the sporadic, and as a rule the thyroid body cannot be palpated. Above the collar bones irregular masses of fat may frequently be felt; also upon the arches of the feet, the backs of the hands, and in the abdominal walls.

The mental aptitude is even more feeble than the physical condition. The child sits about, not at all interested in his surroundings, and frequently does not even recognize his parents; if he walks, it is only slowly, with what the Germans call a "bear gait," and this is caused by the lack of co-ordination from paresis, producing stiffness of the knees. There is, however, no paralysis, and the reflexes are present. The innocent victim exhibits no desires, unless perhaps for food, for which there may be a voracious appetite. Constipation is usually present. Young children must be fed almost wholly upon semisolids, for the mucous membrane in all these cases is generally in the same swollen condition as the skin.

Memory is very deficient, and speech is slow, thick and hoarse, and sometimes wanting. The child is evidently idiotic, but the aspect is entirely different from idiocy produced by other causes—such as cerebellar sclerosis or epilepsy. The cretin is not quick-tempered and does not cry easily; on the contrary, he laughs and smiles readily. The

child never sweats, nor do the sebaceous glands secrete anything; but drooling is constant and profuse, and there is a secretion of tears.

A very striking objective symptom is the temperature, which is invariably below normal; most frequently it is 97°, or even lower.

In boys the testicles are small and atrophied, and often only one descends. The heart, lungs, liver, spleen and other internal organs are not usually affected.

To sum up—the organs which are affected by this peculiar disease are the brain, skin, mucous membrane, bones, generative organs and blood; and all of them to about the same degree, although in many cases the body is apparently more diseased than the brain; yet when treated the nervous system shows the least improvement. The severity of the symptoms is of course somewhat dependent upon the length of time the disease has lasted when seen, and upon the age when it began, but mainly upon the degree of impairment of the function of the thyroid gland.

Cretinism may be confounded with fetal rickets, idiocy and infantilism. The children that suffer from congenital rickets are dwarfs, but they do not show changes in the skin, nor are they degenerates mentally. Although the fontanelles remain open for a long time in both diseases, yet in rhachitis that began in utero there is apt to be no ossification of the sutures for a long period, wide spaces of soft tissue occurring instead. Of course the cardinal symptoms of rickets are also present to guide us. Idiotic children, not cretins, do not suffer from retardation of growth; their heads are often very small, and the fontanelles close prematurely. Again, the skin and facial aspect are enough to make a differential diagnosis, except in the Mongolian type of idiocy, which resembles cretinism to a marked degree, so much so that if I had such a case, I should be inclined to try the effect of the thyroid treatment. But mentally the Mongolian idiots are vivacious and mischievous—never apathetic.

Cases of infantilism that are fat, and especially if they have adenoids, might easily be called cretins, but here again the condition of the skin renders a faulty diagnosis very unusual.

Early and slight forms of the sporadic cretinism are often overlooked; the mental apathy, muscular weakness, stoppage of growth, dryness of skin, together with subnormal temperature, if grouped together, no matter to how slight a degree the individual symptoms are present, are enough to justify an experimental course of treatment with the sheep's thyroid.

In the disease under consideration, when autopsies have been made, the gland has sometimes been found wanting; sometimes atrophied with marked increase of the connective tissue, and degenerative changes in the cells and their nuclei; and sometimes a goitrous condition is present, and this is probably in the nature of a compensatory hypertrophy.

The morbid changes in the skin and mucous membranes are due to the infiltration of a gela-

tinuous substance which penetrates the connective tissue; this produces great compression upon the hair follicles, sweat and sebaceous glands,—which accounts for loss of hair and absence of sweating.

The cranial bones are thick; the brain small, with coarse convolutions; the long bones are shortened, and on account of a peculiar crook, their extremities are apparently—although not really—enlarged. There are no visceral lesions peculiar to the disease.

Previous to the experiments of Murray and McKenzie, two English physicians, little or nothing had been done to alleviate this horrible disease. After the Germans and some of his English confrères had failed to produce more than temporary beneficial effects by implantation of the thyroid gland of sheep, Dr. Murray, in 1892, showed that hypodermatic injections of an extract of the gland caused a diminution of all the symptoms; and later Dr. McKenzie fed his patients the same thing by the mouth, and proved it to be equally efficacious when given that way.

The thyroid gland is best given in a powder, since it dissolves rapidly upon the tongue, and none is lost, even if the patient is unruly. It is best to begin with half a grain, three times a day, and gradually increase it. Whenever the temperature goes above 100°, or the child becomes very nervous and does not sleep, the remedy must be diminished or stopped for a while. Later, when the nutritive changes are fully re-established, a very moderate dose once or twice a week may be sufficient.

I take great pleasure in presenting 2 cases for observation. This boy is a typical cretin; he is now 9½ years of age, and this photograph was taken when he was 18 months old (and he had to be pinned to the chair, not being able at that time to sit alone). His mother first noticed, when he was less than a year old, that he could not sit up as her other children had done at that age; also that he was listless; his teeth did not appear till he was nearly 4 years old, and as yet he has but 2 of his permanent set. I saw him first 4 years ago; at that time he could not walk, but could stand up by things.

With the exception of the supraclavicular deposits of fat, he had all the symptoms. He measured 30 inches in height. Under the constant daily use of Armour's desiccated thyroids, he has grown 15 inches in 4 years. He does not yet put words together, and memory is strangely lacking; his mother says that in going from one room to another, he will forget where he had left any article that he was carrying for her. Although he has made marvellous advances, he still presents most of the signs of the disease.

The other patient is myxedematous. She is 32 years of age, and had none of this trouble until 10 years ago. Four years ago she took the powder for some time with decided improvement; but it was neglected, and she now presents all the symptoms necessary for a diagnosis. You will undoubtedly notice the Mongolian aspect, with the bloated face. Let me call your attention also

to the teeth, the neck, the hands and the lower limbs. On one leg she has an ulcer and varicose veins. She menstruates only semi-occasionally. Her sister tells me that she had 2 attacks, during the past winter, of acute swelling of the vocal cords—a condition to which she is probably prone on account of the edematous mucous membrane.

ASSOCIATION OF ANEMIA WITH CHRONIC ENLARGEMENT OF THE SPLEEN.*

BY ARTHUR H. WENTWORTH, M.D., BOSTON.

(Continued from No. 14, p. 378.)

In 1892 Debove and Bruhl¹⁷ published an article on "*splénomégalie primitive*" and reported clinical observations on a case. They repeat Bruhl's statements in regard to the splenic changes and the occurrence of anemia, and add that there is no correlation between the size of the spleen and the degree of anemia. They refer to a case of Rendu's in which there was an *increased* number of red corpuscles in the blood. They are not justified in considering this to be a case of "*splénomégalie primitive*" in the absence of all symptoms except that of the enlarged spleen. In Bruhl's article it is stated to be the splenic form of pseudoleukemia, but is denied in Debove and Bruhl's article.

Gaucher^{17a} claimed that he had described a case of splenomegalie before Debove and Bruhl. At the autopsy was found chronic hyperplasia of the connective tissue in the spleen and atrophy of the follicles. He showed a cast and microscopic sections of the spleen.

Degle in 1891¹⁸ published a case which he called splenic pseudoleukemia; a very incomplete clinical observation of a patient with an enlarged spleen. His argument appeared to be that it was not a case of leukemia and was therefore pseudoleukemia.

In 1892 Rendu¹⁹ described a case of "*splénomégalie*" in a man 37 years old. The symptoms had lasted for 6 years. The spleen had been enlarged for 4 years. The man was born in a malarial district, but he never had had malaria. There was no anemia; on the contrary a blood examination showed 6,200,000 red corpuscles and 6,000 leucocytes. This case is referred to by Debove and Bruhl, West and others as a case of anemia splenica, yet the only symptom which could suggest the disease is the enlarged spleen. After 6 years' duration it was certainly time to expect some symptoms of anemia, if it were a case of splenic anemia.

A somewhat similar case was reported by Peter in 1893,²⁰ under the title of "*splénomégalie primitive*." There was a history of 5 years' duration of the splenic enlargement. The patient was in good health. The blood examination showed 5,363,000 red corpuscles and 11,780 leucocytes. Such cases call for little comment.

Williamson in 1893²¹ published a description of 2 cases of splenic anemia; one in a boy of 9

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