

skin soft and well nourished. These characteristics, the fact that the mental faculties are quite normal, and the ineffectiveness of thyroid treatment render the identification of achondroplasia quite easy.

TREATMENT.—The only measure of any value in myxœdematous infantilism is the use of thyroid preparations. The treatment recommended for cretinism being as applicable here, the reader is referred to page 198. The younger the patient, the greater are the chances of improvement. After puberty has been reached, the results, in so far as the mental status is concerned, are seldom satisfactory.

THYROID HYPERÆMIA AND THYROIDITIS.

This is a very important disorder mainly because of its causative influence upon the conditions just reviewed, *e.g.*, hypoparathyroidia, myxœdema, and cretinism, and the whole gamut of morbid effects of deficient functional activity of the thyroparathyroid apparatus. It is generally recognized in its acute form when the inflammatory phenomena are very marked, but, unfortunately, it is not only in this class of cases that lesions in the organ are provoked. The structure of the thyroid is such, and the quantity of blood circulating through it is so great, that a high blood-pressure, such as that which occurs during high febrile processes, is sufficient to produce areas of interstitial hæmorrhage in the interlobar connective-tissue spaces, which form as many sclerotic areas wherever the damage done has been sufficiently great. As nature provides an excess of thyroid tissue over and above the needs of the organism, however, inhibition of a proportion of the gland below this limit may prove harmless, but if the sclerosis happens to exceed this limit the result is a more or less marked hypothyroidia (or hypoparathyroidia if the parathyroids are involved, which is at least sometimes the case) corresponding in severity with the proportion of thyroid tissue sacrificed. Indeed, we have seen that in all the disorders treated so far in the present chapter sclerosis of the thyroid, with its resulting atrophy, was by far the most prominent pathogenic lesion.

The graver condition, acute thyroiditis, is fortunately comparatively rare. Moreover, while simple hyperæmia, even when

attended by interstitial hæmorrhage, is seldom recognized, acute thyroiditis is attended by severe local and general phenomena, which make it possible to identify it early, to meet it therapeutically and avoid disastrous results. Acute inflammation of the thyroid—apart from that due to the presence therein of goiter, cancer, etc.—is usually provoked by invading bacteria in the course of infections, notably: diphtheria, typhoid fever, scarlatina, measles, parotitis, tonsillitis, erysipelas, pneumonia, pertussis, dysentery, rheumatic fever, puerperal fever sepsis, orchitis, and influenza. It has also been attributed to the action of poisons, constituting what has been termed "toxic thyroiditis"; iodine and the iodides have also been known to cause it along with other signs of iodism. In these inflammatory disorders the glandular tissues undergo marked changes, including desquamation and degeneration of the epithelium, besides the interstitial sclerosis met with in the form previously described. If the area thus affected is large, the functions of the gland may become sufficiently impaired to constitute marked hypothyroidia, which, we have seen, may, in children, arrest general development of both the body and mind. Shields¹⁸ witnessed an instance in which thyroiditis lasting one week led to complete atrophy of the organ and to typical cretinism. In a case reported by Bonney^{18a} the left lobe was converted into an abscess cavity.

SYMPTOMATOLOGY.—Though capable of doing considerable injury to the gland, the acute hyperæmia attending infectious diseases gives rise to few tangible phenomena, *i.e.*, slight swelling of the neck, sensitiveness to pressure, and, perhaps, slight pain during deglutition. Unless looked for, they will seldom be discerned, as they do not cause sufficient discomfort to attract the attention of the patient.

In acute thyroiditis the onset, usually ushered in by a chill, is generally sudden; the most marked symptom is difficulty in swallowing with, sometimes, neuralgic pain which radiates widely in various directions, the ears and neck, even to the arms and occiput; this is sometimes very severe, particularly during deglutition and on moving the head from side to side. If the whole gland is involved and the swelling, which is often the size of a hen's egg, is marked, severe dyspnoea and even cyanosis

¹⁸ Shields: N. Y. Med. Jour., Oct., 1898.

^{18a} Bonney: London Lancet, July 15, 1911.

may occur, owing to pressure of the inflamed organ upon the trachea. Paralysis of the recurrent laryngeal may occur and produce hoarseness and paroxysms of suffocation, but the hoarseness and cough are more likely to be due to involvement of the larynx in the inflammatory process. (Edema of the glottis may also occur, as in cases reported by Lewis and O'Neill.¹⁹)

The identity of the inflamed organ is readily established by causing the patient to swallow, when the tumor will rise, provided the head is not bent backward, which will immobilize the organ. Headache is often present and epistaxis occurs sometimes, owing to pressure of the enlarged thyroid upon the cervical veins and the passive cerebral congestion this produces. Carotid pulsation has also been observed by Broca. The surface of the organ is sometimes quite congested. There is more or less fever during the acute stage; it is sometimes quite high notwithstanding the absence of suppuration—a fact which is ascribable to the excessive production of thyroiodase. Tachycardia independent of temperature has also been noted by Parisot.²⁰ As observed by Jeanselme, the coagulating power of the blood is greatly increased. The morbid process lasts, as a rule, but a few days, the swelling subsiding completely in most instances. Occasionally a certain amount of enlargement may persist. Forty per cent. of the cases terminate in resolution, *i.e.*, without suppuration.

When an *abscess* is formed the course of the morbid process is more protracted. A single abscess rarely occurs, the glandular mass being studded with numerous purulent foci, which, if close one to the other, tend to run together. Each abscess tends to break through the adjacent soft tissues, including the skin. The trachea and œsophagus may therefore be invaded by a purulent stream when rupture occurs. Metastatic abscesses may also appear in the cervical cellular tissue. When spontaneous rupture occurs through the skin, or when the abscess is surgically evacuated, the inflammatory process recedes rapidly. When, however, it is left to itself, the purulent infiltration of surrounding parts may give rise to serious complications, by

¹⁹ Lewis and O'Neill: Jour. Amer. Med. Assoc., Nov. 12, 1910.
²⁰ Parisot: Presse Médicale, May 7, 1910.

involving, besides the trachea and œsophagus, referred to above, the mediastinum, the pleura, and the lungs proper, causing septic pneumonia, and also the large vessels of the neck and chest and thus causing pyæmia. Thyroid abscesses bleed readily and are sometimes the source of severe capillary hæmorrhages.

Chronic thyroiditis may follow the acute type, either through perpetuation of the infection in some small portion of the gland or the formation of a sinus which fails to heal. In the majority of instances, however, it occurs concomitantly with chronic processes, such as syphilis, tuberculosis, echinococcus cysts, actinomycosis, etc. The prognosis in these cases is less favorable than in the acute form, since more or less impairment of the functions of the organ follow the destructive action of the abscess upon the glandular tissues owing mainly to the fibrous induration it entails in various parts of the organ. Both the acute and chronic types are prominent causes of hypothyroidia with its long train of morbid results, ranging from cretinism through its many modalities to the milder types of myxœdema described.

DIAGNOSIS.—In the acute form, the increased volume of the gland, which sometimes becomes greatly enlarged in a few hours, the sensitiveness to pressure, and the radiating pain, all located in the region of the thyroid, coupled with the fact that, on swallowing, this organ, *i.e.*, the seat of all these acute symptoms, moves up and down, render the diagnosis quite easy in well-marked cases. When, as is often the case, the inflammation is unilateral, especially if œdema of the tissues prevails, it may resemble mastoiditis or parotitis and has, in fact, often been taken up for the latter disease. Its connection with a mobile structure on the other side of the neck, however, renders the differentiation possible. If abscesses form, fluctuation is sometimes discernible. (Esophageal abscess in the neighborhood of the thyroid furnishes much the same symptoms, but the mobility of the gland during deglutition makes it possible to identify it as the seat of abscess.

TREATMENT.—The prevention of acute thyroiditis, even in its milder forms, is an important feature in this connection, when we consider its pernicious effects upon development of the child and upon the general welfare of the individual at all ages.

As previously stated, the main cause of the lesions is the excessive proteolytic activity of the intrathyroidal plasma, owing to the identity of the organ as the source of the substance which, as I have pointed out, is the homologue at least of Wright's opsonin—*i.e.*, the thyroiodase. The presence of bacteria in the thyroid brings to it, as elsewhere, all the defensive constituents of the blood, both fluid and cellular. The excess of opsonins increasing the vulnerability of the thyroidal tissues to the proteolytic activity of these antibodies, however, these tissues yield readily to the destructive action of the latter. The aim, therefore, should be to prevent this complication in the course of febrile infections.

Two measures of value are at our disposal in this connection. The first of these is the local application of cold. The thyroid should be carefully watched for any complication, and if it becomes sensitive or swollen, or the patient complains of pain in the thyroidal area, cold compresses should be applied over it. The effect of cold is to reduce local temperature and through this the activity of the proteolytic enzymes which the antibodies of the blood contain. In other words, it is not bacteria which do the damage, but the excessively active germicidal substances they invite into the gland, and by reducing this activity with the aid of cold the *excess* of digestive power is antagonized. That the bacteria are less violently attacked under these conditions is obvious, but it is far better to allow the bloodstream to transfer the germs elsewhere in the body for destruction, *i.e.*, to the general circulation, where their destruction can proceed without compromising the integrity of any tissue so vital to the welfare of the body as the thyroid.

The second measure is the free use of physiological saline solution, either by the mouth, rectum, or subcutaneously, to reduce the viscosity of the blood. Not only does this counteract excessive proteolytic activity of the antibodies which underlies their destructive action on the thyroid and other tissues and cells—the underlying causes of hæmolysis and autolysis—but it facilitates osmosis and therefore the circulation through the thyroid, which has been fittingly compared by Bérard to a sponge, so replete is it with blood. Another advantage of the use of saline solution is that, as shown elsewhere (see page 1367),

it enhances the activity of the autoprotective process while facilitating the renal elimination of toxins or the end-products.

The treatment of acute thyroiditis likewise includes the use of the above measures besides the remedies the causative disease warrants. One feature of importance in this connection is that a high blood-pressure is a pernicious feature of the disorders; vascular depressants, such as chloral hydrate and veratrum viride, preferably the former, therefore, are of considerable value. J. C. Wilson has shown that chloral hydrate can be used advantageously to reduce the peripheral congestion and general distress in scarlatina. As this and other exanthemata are relatively frequent causes of acute thyroiditis, it may safely be employed to counteract this condition.

Surgical measures often become necessary. According to Kocher²¹: "The presence of pus is difficult to demonstrate and premature incision must be avoided. If necessary, the gland itself should be exposed. If incision of the abscess is not followed by rapid recovery, the presence of multiple abscesses should be suspected. Fistula points to extensive necrosis. In such a case the affected half of the gland must be excised. Partial thyroidectomy may also be considered in cases of thyroiditis that have become chronic and in chemicotoxic thyroiditis." In the chronic thyroiditis attended by hypothyroidia, thyroid gland should be given, and the actually diseased part removed surgically, especially if dyspnoea is present.

²¹ Kocher: Keen's "Surgery," vol. iii, p. 380, 1908.