soft, but mesenteric glands small and pink. Heart 16 oz., dilated, hypertrophy of left ventricle, no endocarditis, muscle soft and friable. Lungs oedematous, collapse of right. Thyroid enlarged and no typical colloid appearance on cutting. Cause of death cardiac failure.

Microscopical Examination.—The fibrosis in the neighbourhood of the receptaculum chyli (see Fig. 2) contained some lymph glands with markedly dilated varicose spaces lined by endothelium and evidently lymph channels, similar spaces appearing in the adipose and fibrous tissue around the glands. The enlarged soft inguinal glands showed similar dilatation of the channels, together with some thickening of the fibrous trabeculae, but the mesenteric glands were normal. The lymphoid tissue of the affected glands was also more diffuse, and the follicles less distinct. The skin showed typical advanced oedema, marked dilatation of the lymphatics, which often were surrounded by and sometimes filled with small round cells, hyperplasia of the connective tissue elements and thickening of the arterioles (see Fig. 3). Liver capsule thickened, capillaries engorged and dilated, some chronic hepatitis evinced by round-cell infiltration of Glisson's capsule, and especially beneath the capsule in the depressions between the fine granulations mentioned, but no definite cirrhosis, the condition suggesting a spread of inflammation from the perihepatitis. The hepatic cells adjoining the dilated capillaries were atrophied where the engorgement was most marked.

Kidneys: Intense hyperaemia, granular epithelium, wedge-shaped areas of cell infiltration in the cortex such as seen in early interstitial nephritis. Suprarenals fairly normal, though embedded in fibrous tissue, and showing early struma lipomatosa; the enveloping fibrous tissue showed dilatation of the lymphatics. The intestinal mucosa was fairly normal, and no dilatation of the lacteals was evident, though there appeared to be an unusual amount of round-cell infiltration in and around the bases of the glands. Unfortunately the large intestine was not examined histologically, so nothing can be said as to the condition of its lymphatics.

Sections of the mesentery showed thickening of subendothelial fibrous tissue on both sides with evidences of chronic inflammation in the shape of accumulation of round cells around the vessels. No noticeable dilatation of lymphatics.

In the thyroid, coarse structure present in sections with acini of varying size and irregular outline, but the colloid material was practically *nil*, only a very small remnant being found. Acini only in a few instances showed remains of a cuboidal epithelial lining, yet their lumina were filled with spheroidal cells which appeared to have arisen in a proliferation of the epithelium.

The morbid appearances found may be summarized as follows:

Chronic peritonitis, with especially prominent perihepatitis, perisplenitis, and prevertebral fibrosis surrounding the lymphatics at about the level of the receptaculum chyli. Below this a varicose condition of all the lymphatics and an oedematous and hyperplastic condition of the parts drained by these affected vessels, but not of the mesenteric lymphatics or lacteals. Some chronic hepatitis, especially subcapsular, and a slight interstitial nephritis. Thyroid enlargement with diminution of colloid and proliferation of epithelium (comparable with exophthalmic goitre). Cardiac dilatation.

Anatomically the condition is explainable on the view that the fibrosis had interfered with the lymphatic course at about the level of the receptaculum chyli, above the point of entry of the lymphatics draining the lower part of the body, which includes the abdominal wall as far as the umbilicus (and here note the decreasing oedema of the parietes from the pubes up to the umbilicus, where it ceased), but below the junction with the lacteals and vessels from the coeliac glands. These latter are said to enter the first part of the thoracic duct. The rectal lymphatics generally open into the sacral glands, but, as mentioned above, an examination of the rectal mucosa was unfortunately neglected. Oedema and hyperplasia from excess of lymph in the parts would follow a chronic obstruction, and is a well recognized phenomenon. The ascites might be due in part to this cause and to some extent also to the cardiac failure. It must be remembered also that ascites is commonly associated with chronic peritonitis. The presence of a large number of lymphocytes in the fluid obtained by paracentesis points to some lymphatic obstruction.

Apparently, then, the condition is one of chronic peritonitis of peculiar distribution. Cases of prevertebral fibrosis are occasionally met with on the *post-mortem* table, but the complications here described consequent on implication of the lymphatic system appear to be very rare. The etiology can, however, be merely speculative. Proliferative peritonitis, according to Osler, is found frequently in subjects of chronic alcoholism. Rolleston says, "Cirrhosis of the liver is often associated with a

certain degree of chronic peritonitis, but a high degree is comparatively rare in association with well-marked cirrhosis."

It may be that the toxin which causes both conditions has in this case exerted its influence more on the peritoneum than on the liver, which showed merely a cellular interstitial hepatitis of no marked degree.

And, finally, into the realm of unconfirmable speculations may be brought the mechanical factor of the oft-repeated prognancies with a consequent chronic inflammation—the hepatic and renal conditions being lesions apart and associated with alcoholism. Whether the exophthalmic goitre was merely an accidental complication—which seems probable—or not, is impossible to say.

THE RELATION OF DIET TO THYROID ACTIVITY.

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As the result of a series of experiments conducted with a view to determine the effect of heat upon the nutritive value of milk, I have been led to a particular study of the thyroid glands of the animals experimented upon.

The prevailing custom at the present time of the pasteurization of milk for infant feeding and the very divergent views held regarding the advantages and disadvantages attendant on the custom, were in the first place the reasons which induced me to undertake these experiments. The results obtained as regards the respective value of plain milk, pasteurized milk and sterilized milk, as a food, have proved inconclusive both positively and negatively.

Certain facts, however, concerning the structure of the thyroid gland in these animals would appear to be worthy of being placed on record, the variations in structure obtained being constant within narrow limits and corresponding to the diet employed.

My experiments were conducted in the Physiological Laboratory of the University of Edinburgh, and to Professor Schäfer my warmest thanks are due. In all, the thyroid gland was examined in the case of 94 rats—5 of these being wild rats. The remaining 89 animals of 14 litters were dieted from the date of weaning (usually the twenty-first day) for periods varying up to sixty-seven days. Seventy-three of these rats from 11 litters were fed, thanks to the kindness of Dr. Robertson, Medical Officer of Health for Leith, upon modified milk obtained from the Leith Milk Dépôt, while the remaining 16 rats of 3 litters were fed on ordinary dairy milk.

In the case of those rats reared in the laboratory, animals from the same litter were placed at the time of weaning on (1) bread and milk diet¹; (2) fresh milk; (3) the same milk pasteurized; (4) the same milk boiled for thirty minutes.

In all cases an unlimited supply was given, no marked difference being noticed in the amount taken by rats on the three milk diets.

Rats of the various litters, when weaned, were weighed and divided as evenly as possible between the four diets, and thereafter were weighed every third day.

As regards increase in weight, practically no difference was noticeable between the various milk-fed animals, but in all milk-fed animals the increase was less than in corresponding bread-and-milk-fed rats. Clinically all rats at the period of death appeared perfectly healthy, milk-fed rats being, however, in the majority of cases, somewhat softer and plumper than those fed on bread and milk.

The rats in all cases were killed with chloroform, and the tissues examined *post mortem*. In all cases of milk-fed rats there was considerable deposition of general body fat. This increase of fat was most marked in the abdominal cavity, and was in some cases very excessive. In all milk-fed rats the thyroid glands were of a markedly paler colour than those of animals fed on bread and milk.

The organs and tissues were fixed in 5 per cent. formalin and stained with haematoxylin and eosin after, in the case of the bones, decalcification with Perenyi's fluid. The bones, spleen, liver, pancreas, kidney, suprarenal, thymus, and thyroid, in each case, were examined microscopically, and, apart from the thyroid gland, no constant

marked differences were observed corresponding to the diets used. In the case of the thyroid gland, however, altogether different conditions were found when the rats were grouped under the three headings of (a) wild rats, (b) bread-and-milk-fed rats, (c) milk-fed rats.

As regards the thyroids of rats on the three varieties of milk food, in 80 per cent. of cases no distinct difference was observable, while in the remaining 20 per cent. of cases the structure of the gland varied constantly according to the form of milk used, yet in all the characteristic features corresponded very closely with the general type of the remaining milk-fed animals.

The glands of all animals fed on bread and milk showed a constant picture, within extremely narrow limits, while those from the wild rats (caught together at the same place at the same time), though showing somewhat wider variations, yet in all cases displayed, in a greater or less degree, the same nature of differences from both the preceding types of gland.

Fig. 1 shows the form of gland in a milk-fed rat. In it the vesicles are large, well filled with colloid material and the lining cells are small with deeply-staining nuclei.

In Fig. 2, the gland of a bread-and-milk-fed rat, the vesicles are seen to be very markedly smaller and the amount of colloid present very considerably less. Whereas, in the case of milk-fed rats, each vesicle consists of a large lumen surrounded by a narrow ring of somewhat flattened cells; here it consists of a ring of columnar cells enclosing a minute lumen or lying apparently almost in contact.

Examination of the glands of wild rats (Fig. 3) shows them to be of a more or less intermediate nature between

variations in the series of glands examined corresponded with the differences in diet.

That the type of gland met with in each of the three classes of cases was one of a variation within the limits compatible with a normal healthy animal seems certain. The thyroid gland of rats is obviously an organ extremely susceptible, and also extremely adaptable, to variations in diet, and in healthy animals the structure of the gland

varies within fairly wide limits. But while this is undoubtedly the case, yet it is also equally apparent that along with varying types of sound health and of healthy thyroid glands are associated different degrees of activity of that gland. Normally the gland, within wide limits, responds readily to the diverse calls upon it, and, with a greater or less degree of activity, the normal condition is maintained. Should, however, the potential activity of the gland be, from any cause or in any manner, less than usual, obviously a healthy condition is only to be maintained by restricting the call upon it well within the normal limit; and, consequently, it is important to determine the relation of varying diets to the strain thrown upon the gland.

Swale Vincent and Jolly²

affirm that no statement universally applicable throughout the animal kingdom can be made as to the importance of the thyroid and parathyroid glands, and the former author³ states that in rats and guinea-pigs extirpation of both thyroids and parathyroids is never followed by myxoedema. The extreme difficulty of this operation of total extirpation—certainly in the case of rats—seems to warrant some hesitation in arriving at the conclusion that the function of the organs in these animals is so

Fig. 1.—Rat, aged 10 weeks, weight 76 grams. Plain milk.

Fig. 2.—Rat, aged 10 weeks, weight 79 grams. Bread and milk.

those of milk-fed and those of bread-and-milk-fed animals. Compared with sections from bread-and-milk-fed animals, the vesicles appear distinctly larger, they contain considerably more colloid material, and the lining cells show a greater variation in shape.

These glands, one and all, it must be remembered, were removed from animals clinically in perfect health; and, while the thyroid gland is an organ well known to be subject to considerable variations in structure, yet the interest in the present note rests in the fact that the

Fig. 3.—Rat aged (?), weight 92 grams. Wild rat.

totally different from that found elsewhere throughout the animal kingdom.

REFERENCES.

- ¹ Watson and Hunter, *Journ. of Physiology*, vol. xxxi, Nos. 1 and 2.
² *Journ. of Physiology*, vol. xxxii, 1904. ³ *Lancet*, August 18th, 1906.

A SCHOOL of malingering has been discovered in Rome in the course of inquiries made by insurance offices in regard to claims for injuries said to be the result of accident.