case is especially interesting; there had already been improvement following the administration of Morbius's anti-thyroid serum.

"At the end of January," Dr. Gilmour reports, "we were able to begin the milk from thyroidless goats, and within a fortnight there was again an improvement. The pulse-rate declined to 88, and the mental symptoms ceased. Accidentally, we had to stop the milk for about ten days, and during this time the goitre again became prominent, and the symptoms showed signs of returning. During each exacerbation diplopia was present and troublesome. About the third week in February she had the entire milk-supply from one goat, and rapid improvement set in. The goitre diminished. She became very cheerful, happy, and contented. The pulse-rate fell to 64 per minute. The points of interest in this case are the very marked variation which occurred in the thyroid gland coincident with the use of anti-thyroid remedies, and the accompanying improvement of the mental symptoms."

Devonshire-place, W.

A CASE OF "TYPHOID SPINE."

By E. ROCK CARLING, M.B., B.S. LOND., F.R.C.S. ENG.,
SURGEON, SEAMEN'S HOSPITAL, GREENWICH; ASSISTANT SURGEON,
WESTMINSTER HOSPITAL, ETC.;

AND

L. R. KING, M.R.C.S. ENG., L.R.C.P. LOND.

A BOY, aged 15 years, was admitted from the *Arethusa* to the Seamen's Hospital, Greenwich, under the care of Sir William Bennett on Oct. 25th, 1909. Dr. C. G. Pugh, medical officer of health of Southend-on-Sea, gave the following particulars of the boy's illness:—

"He arrived in the borough on a day trip on July 9th; he had for several days felt ill, although he had not declared himself 'sick,' as he was anxious not to miss the day excursion. During the afternoon he became worse, complained of abdominal pain, was feverish, and was consequently admitted to the local voluntary hospital with a diagnosis of appendicitis. His condition not improving, laparotomy was performed on the following day, his appendix being removed. On July 13th I was asked to see him in consultation with the visiting surgeon as his symptoms pointed to the possibility of his illness being enteric fever. His spleen was enlarged, he had a few doubtful spots, and he was passing typical pea-soupy stools. His blood giving a good Widal reaction, he was on July 14th admitted to the borough sanatorium as a case of enteric fever.

His temperature fell gradually and became normal on July 20th. During the intervening period he continued to pass pea-soupy stools, some of which contained sloughs, and upon one occasion he had slight hæmorrhage from the bowel. On July 26th his temperature again became raised, a slight fulness could be felt above the pubes, and he complained of a frequent desire to go to stool. Upon rectal examination I felt a large swelling bulging into the right side of the rectum just below the brim of the pelvis. The surgeon who had operated previously was called in consultation, and as on the 29th of July the rectal swelling had become more marked and softer, while the fulness above the pubes was increased, he decided to perform laparotomy again. He made an incision in the mid-line, gradually broke down the adhesions between the subjacent coils of small intestine, and came upon a tense collection of fluid, just below the brim of the pelvis on the right side; the fluid, which proved to be turbid but not very offensive, was evacuated, and a drainage tube inserted. On the following day the temperature fell to normal; the discharge from the tube soon diminished, so that by August 26th the wound was superficial. The boy was discharged apparently well on Sept. 4th, the wound being healed."

The lad returned to his training ship, the *Arethusa*, and remained well till early in October, when he began to complain of pain in the back, for which he was put to bed on the 11th and sent to hospital a fortnight later. He was able to walk without pain, but it hurt him to bend his back. He appeared well-nourished. Beyond the scars of recent operations the abdomen showed nothing abnormal. The spleen could not be felt, though there was slight tenderness below the left costal margin. Upon examination of the back the spines of the eleventh and

twelfth dorsal and first lumbar vertebræ were seen to be prominent, whilst there was a deviation of the column to the right from the level of the disc between the twelfth dorsal and first lumbar, compensated by a very gentle curve with concavity to the left in the upper dorsal region. The prominent spines were tender to percussion. Pain was elicited by jarring the spine as a whole and by pressure on the outer ends of the two lowest ribs. The knee-jerks and ankle-jerks were decidedly brisk, but the plantar reflex was flexor, and there was no disturbance of sensation. The spine was rigid in the whole lumbar and lower dorsal regions. On stooping down he was obliged to help himself upright by his hands on his thighs. There was no rotation below the cervical region. The temperature on admission was 99° F., and on the 28th it rose to 101.2°; he complained of "starting pains" which were immediately relieved by weight extension. On Nov. 2nd Dr. J. J. Braxton Hicks reported: "Widal reaction positive; microscopic method, dilution 1—30, in half an hour; sedimentation method, flocculi appearing at the end of three hours." This reaction was still to be obtained in February, 1910.

The progress of the case was steady but slow. The temperature was never seriously raised, but was a little above normal, with an occasional sharp rise of a couple of degrees. By the end of January the prominence of the spines had disappeared and a considerable degree of mobility had returned. No thickening was palpable on the dorsal aspect of the column. An X-ray photograph taken on Oct. 27th showed a very dense shadow over the bodies of the ninth, tenth, and eleventh dorsal vertebræ, extending laterally beyond their limits and expanding from above downwards to a point an inch outside the articular process on the right side and rather less on the left. The right edge of this shadow was rectilinear and well defined; the left edge was irregular and not so well defined below. Three weeks later a radiogram showed similar appearances but with modifications. The main mass of shadow was less dense, whilst indications of a localisation to the costo-vertebral articulations could be made out.

The interpretation of these radiographic appearances is by no means easy, but considered in conjunction with the clinical signs it may be taken to indicate a perfectly definite local lesion, in all probability an effusion beneath the periosteum or the anterior and lateral ligaments and around the costal joints. Very little new bone formation has resulted, and the maintenance of extension has permitted almost complete rectification of the deformity. There is strong presumption that the lesion was a spondylitis or paraspondylitis due to the bacillus typhosus.

Recent papers by Neisser,¹ Lord² (analysis of 26 cases), Fluss,³ McCrae,⁴ and Halpenny⁵ have expanded our knowledge of the condition, and in particular have relegated the ideas which formerly prevailed as to the neurotic basis to their proper symptomatic limitations. Halpenny gives a bibliography of some 90 numbers and collates 73 cases. Briefly, his analysis shows that the majority of cases occur between the age of 20 and 35 years; males predominate (83 per cent.). The onset may be sudden (10 cases) or insidious (39 cases), is often determined by trauma, and occurs during convalescence in two-thirds of the instances; the lumbar region is by far the commonest site. Pain may be so severe as to require morphia or even chloroform; fever is not always present. Deformity is mentioned in the reports of 23 patients; in a few instances there have been signs of pressure on nerve-roots and in others of changes in the cord. Very few cases have been operated upon, and it is not clear that in any instance a pure typhoid osteomyelitis of the vertebral bodies was demonstrated. It is of interest, however, to recall that Quincke and Stuhler found the bacillus typhosus in the rib marrow of eight out of nine fatal cases, and that Fraenkel in all of ten cases found the bacilli in the cancellous tissue of the vertebræ, the greatest numbers being present in the lumbar region. The duration, as stated in 34 cases, is usually from three to five months, but one of two years is recorded. Mention of non-recurrence is made in 58 reports. X-ray examinations appear to have been made in 11 cases; in one

¹ Neisser: Deutsche Aerzte Zeitschrift, 1900, 23.

² Lord: Boston Medical and Surgical Journal, 1902, vol. i., p. 689.

³ Fluss: Centralblatt für die Grenzgebiete der Medizin und Chirurgie, 1905, 8, No. 17 et seq.

⁴ McCrae: American Journal of the Medical Sciences, 1906, vol. ii., p. 878.

⁵ Halpenny: Surgery, Gynæcology, and Obstetrics, December, 1909, p. 649.

or two nothing abnormal has been found. For the most part, new bone filling in the intervertebral spaces or in the lateral ligament, or definite synostosis has been indicated. A case reported by Silver is described thus: "..... On the right the lateral borders of the two vertebral bodies formed an unbroken line; on the left there was an irregular shadow projecting outward between the transverse processes," and seems to correspond to our case.

A NOTE ON THE MINUTE STRUCTURE OF THE THYROID GLAND.

By D. CHALMERS WATSON, M.D. EDIN., F.R.C.P. EDIN.,
ASSISTANT PHYSICIAN, ROYAL INFIRMARY, EDINBURGH.

IN the course of an investigation into the effects of varying diets on the structure of the tissues and organs in tame rats, my attention has incidentally been directed to the varying histological appearances of the thyroid gland in wild rats. The examination of the thyroid gland in a series of 40

those of the fully grown subjects in the same series it is assumed that the differences in the histological appearances to be described are not directly associated with the age of the animal, and accordingly no further differentiation will be made between the condition of the gland in young and adult subjects.

Histological appearances.—The microscopic appearances of the gland vary considerably. In many glands the vesicles are large and full of colloid, which takes a very delicate pink stain with the hæmatoxylin and eosin stain; a few of the vesicles may be empty or may contain a clear watery secretion. The secreting cells lining the vesicles are flat in character and consist of a darkly stained nucleus with a very small amount of protoplasm in the body of the cell, the nucleus occupying the entire breadth of the cell. There is a relatively small amount of intervesicular glandular tissue. Blood-vessels are inconspicuous. Fig. 2 illustrates another type of gland which differs from the first chiefly in presenting a more cellular appearance and containing less colloid; as in the former instance, the colloid may be stained a delicate pink or may have no affinity for the hæmatoxylin and

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

wild rats, all apparently healthy, has shown wide variations in the histological appearances of this gland. This point is one of considerable interest, and, so far as I am aware, attention has not previously been directed to it. The source from which the animals were obtained was noted in all instances, the rats being caught in such diverse places as a sewer, a hotel basement, outhouses of an asylum, railway station, a canal bank, and a bird shop. The weights of the rats ranged 60 to 370 grammes, 20 of the number weighing 200 grammes and upwards. As it was observed that the histological appearances of the gland in quite young animals were not strikingly different from

eosin stain. Blood-vessels are prominent. On high power examination the secreting cells are of a low columnar or cubical shape, the nucleus being of a moderate size and circular shape, and occupying the entire breadth of the cell. There is a moderate amount of intervesicular glandular tissue, the nuclei in these cells being considerably larger than those of the cells lining the vesicles. There are also glands intermediate in structure between those represented in Figs. 1 and 2 respectively. The appearances represented in these figures were present in 31 of the series of 40 animals; in 26 out of the 31 the type of gland was similar to that shown in Fig. 1.