Kinlon (1906). It has also been suggested that the suprarenal cortex has antidotal properties for certain poisons, such as snake venom (Myers, 1907).

Biedl states that he has been able to remove the cortex, leaving the medulla intact, and that the operation was followed by the death of the animals; but I think the experience of most people would lead them to believe such a separation to be impossible. And, as I have already stated, Vincent did not find removal of the interrenal body in the eel—which undoubtedly represents in that animal the cortex of the mammalian organ—to be fatal.

That the cortical cells are internally secreting structures is pointed to by their epithelium-like appearance and the richness of the arterial blood supply of this part of the organ. Ciaccio (1906) has described in the cells what he regards as evidences of secretory activity, such as are met with in the cells of ordinary secreting glands. But even without direct evidence it is difficult not to believe that the cortical cells produce an internal secretion, which is either taken up by the blood or is otherwise conveyed away from the cell columns. It is open to us to suppose that these may initiate the preparation of the internal secretion (adrenin) of the medulla, or that they may prepare an enzyme which completes the formation of that substance. The experiments of Abelous, Soulié and Tougan (1905) are confirmatory of this suggestion but do not carry conviction. On the other hand, there are both anatomical and pathological reasons for believing that the internal secretion of the cortex is independent of that of the medulla and produces quite different effects in the organism.

According to Della Vida (1904), cytotoxic serums prepared from the two parts of the gland are only toxic for their respective parts. That the suprarenals are related in some way to metabolic changes in the tissues and organs there can be little doubt. This is indicated by the symptoms of Addison's disease. Some of these symptoms can be referred to the absence of medullary secretion. But others, such as the extreme wasting (when not due to general tuberculosis) and the malnutrition which is expressed in the abnormal pigmentation of the skin and mucous membrane, are not readily referred to the medulla, and are probably the result of disease of the cortex. In assuming that the cortex of the organ subserves through its internal secretion certain functions connected with metabolism, we have an analogy with what is known regarding the pituitary body. In this, again, we find an instance of a small ductless gland, partly epithelio-nervous and partly purely epithelial in structure and origin, the two parts having different functions, although bound up together into a single organ. Of the two parts the nervous part, as in the suprarenals, produces a substance or substances such as it is now customary to term "hormones," which influence the circulatory organs and certain externally secreting glands—in the case of the suprarenals it is salivary glands, in the case of the pituitary it is the kidneys which are especially stimulated to secretion. The purely epithelial part of the pituitary, on the other hand, is closely connected with the growth and nutrition of certain of the connective tissues and especially of the bones—hyperplasia of the organ being accompanied by symptoms of gigantism and acromegaly. It seems, therefore, that from analogy we have some justification for inferring that the cortex of the suprarenals may yield a hormone which influences the growth and nutrition of certain tissues and organs. One might even be permitted to suggest that the integumentary tissues and the generative organs—with the relative development of which it is manifestly correlated—are directly under its influence. But I am getting away from the subject of my lectures and substituting for what is known regarding the functions of the suprarenals what is only conjectural. The digression is fascinating, but time will not allow me to pursue it. Perhaps within the next few years a successor of mine in this lectureship will be able to put before you as much positive knowledge regarding the cortex as we now possess regarding the medulla, the function of which seemed, no more than fifteen years ago, as obscure as that of the cortex appears at present. And with the hope that this obscurity may speedily be removed, I cannot do better than terminate my discourse,

AN UNUSUAL CASE OF APPENDICITIS.*

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THE case here referred to is one that clinically shows nothing remarkable in symptoms, progress, and recovery. But the anatomical features are so unusual as to deserve notice, while they also throw light on recent pathological research.

A gentleman aged 41, on a voyage from New Brunswick to Liverpool, was seized in mid-Atlantic, about December 11th, 1907, with severe pain and tenderness in the right iliac fossa and an indurated swelling, naturally attributed by the ship's doctor to appendicitis. He was put to bed and otherwise looked after, while a message was sent by wireless telegraphy to his home in London, asking for arrangements to be made for his reception in Liverpool, and, if necessary, immediate operation at his landing on December 14th. These arrangements were made by Dr. Steeves of Liverpool, who had the patient admitted into a nursing home. The ship's doctor reported on landing the absence of immediate urgency, and it was not till five days later, on account of a temperature of 102° F., an increased swelling, with elasticity and a suspicion of abscess at the locality, that I was called in consultation with Drs. Steeves and Richards to settle the question of operation. This was felt to be imperative, and was fixed for the following day, December 20th, 1907. An incision was made over the iliac fossa, the abdominal muscles divided in the line of their fibres, and the peritoneum opened in the line of the

Photograph, about natural size, of specimen in water four months after operation, by Fred. Halliday, museum assistant. A, Blind end of appendix. B, End cut from caecum.

skin incision. No abscess was found, but the caecum showed an altogether unusual structure in the site of the appendix. This latter was removed and the bowel closed, a drainage tube put in, and sutures in the various layers. The progress of the patient was in all respects satisfactory, without fever, and all was healed in a few weeks.

Anatomy and Pathology.

On searching in the indurated mass of caecum and omentum nothing could at first be found of anything like an appendix in shape. On raising the caecum from its bed in the iliac fossa there appeared a sort of pouch at its lower end and passing behind. On further search this proved to be appendix, but totally unusual in shape and size, even when compared with the many varieties of alteration produced by disease. By dividing a peritoneal layer this pouch was found about 3½ in. long and 1½ in. wide, of the shape and size of a walnut at the blind end, narrower between that and the caecum, and again wider at the junction. On opening the pouch it was found to contain mucon granular grey pasty material, no faeces or pus, and to be deprived in parts of all mucous membrane, the wall being thin, and consisting in those parts of little else than peritoneum. The pouch was too bulky to clamp and tie, so it was cut off with scissors, the stump inverted, and the folded peritoneal edges sewn together doubly for safety. The opening leading to the caecum was about ⅜ in. wide, and filled with the paste above noted.

It is difficult to imagine that an appendicular pouch of this size, folded under peritoneum at the back of the caecum, without any signs of cicatricial deformity, could

* Read at a meeting of the North Wales Branch of the British Medical Association at Denbigh, April 21st, 1908.

have acquired this shape by any known pathological process. If it were not that no reference can be found to any such human variation of the appendix, in either disease or health, one would be inclined to class it among the multifarious forms in lower animals, where in a monkey, an anteater, and some birds, the appendix has this actual shape (Howard A. Kelly).

As regards the personal history of this patient, the only facts I could elicit were that he had been a large eater, and only slightly affected with constipation, if noticeably at all. From the first notice of disease to the day of operation only nine or ten days had elapsed, and he had never before been similarly affected. If this strange appendix had ever been highly charged with morbid products, there was no lack of room for their admission into the caecum by the fairly wide passage between the two; but the absence of mucous membrane over such an extent would seem to have permitted the absorption by imbibition of toxic products, accounting for the fever, pain, and inflammation.

My friend, Dr. O. T. Williams of Liverpool, has for some time past been engaged in a special study of the pathology and chemistry of appendicitis and mucous colitis, and finds the present case and specimen an apt illustration of some of his conclusions. For a detailed account of his studies I may refer to the BRITISH MEDICAL JOURNAL of July 27th and August 17th, 1907, and to the *Biochemical Journal*, vol. ii, No. 9; but I here add an epitome of the same, written for me by himself, with his description and criticism of my specimen:

The Etiology of Appendicitis.

The appendix, normally, as the result of age, undergoes involution, with which is a certain amount of fatty degeneration, especially in the submucosa. I have studied the nature of this change and found it to bear no comparable relation to the fat changes which the walls undergo in cases of appendicitis, where in cases even in young children the mucous membrane, and especially the submucosa, shows the formation of large quantities of calcium soaps. The latter often form a dense ring in the submucosa. They can in some sections be seen to be forming the concretion which I have shown to contain these same soaps. These soaps are again found in "intestinal sand"—in a malady which is closely allied clinically to appendicitis. The conclusion arrived at is that in these (and in certain other conditions) there is an abnormal production of these soaps. In appendicitis they so lower the vitality of the mucous membrane as to make the invasion of organisms an easy matter.

Mr. Parker's Specimen.

There is a large distended appendix consisting of two main divisions. The distal part is a large globular cavity which contained the material mentioned as having been emptied; some of it being still adherent to the sides. The proximal part shows the wall very much thickened by hypertrophied muscle, probably due to the attempts to empty the above material into the lumen of the bowel. The material examined is found to consist of calcium carbonate, fat, and calcium soaps. The probable explanation of the condition is that the calcium soaps formed in the submucosa and mucous membrane, were excreted into the lumen of the appendix, and so dilating it considerably; the large amount of hypertrophy of muscle even failing to discharge it. Later the calcium soaps still further decomposed, producing a certain amount of calcium carbonate.

The degeneration and distension has caused the disappearance of the whole of the mucous membrane.

A CASE OF COMPOUND FOLLICULAR ODONTOMA.

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(Exhibited in the Surgical Section at the Annual Meeting, 1907.)

IN the following case more than 100 denticles were removed from the lower jaw by several operations, and the treatment extended over a long period.

History.

W. B. was a well-developed and healthy boy. When 11 years of age a swelling was discovered by his parents on the right side of the mandible, and it was then regarded as only an ordinary dental trouble. It caused no pain, only a feeling of stiffness and discomfort in the mouth, especially after eating. During the next four years the tumour increased in size and rendered mastication difficult. On several occasions he was examined by medical men, and his parents were informed that the growth was probably of a dangerous character.

Condition on Admission to the Hospital.

The late Dr. Crouch of Gosport sent the patient to me in 1896. He then appeared in good health, and complained only of the increasing swelling of the jaw, which prevented him opening his mouth and greatly impeded mastication. There was considerable disfigurement of the right side of the face. The tumour involved the mandible behind the bicuspid region, and extended backwards to the angle and ramus. The mouth appeared to be half filled with a growth, and the teeth could not be separated more than ½ in. The post-nasal space was free, and deglutition was not obstructed. (See Fig. 1.)

Treatment.

An exploratory operation was at once performed. An incision was made downwards and outwards about an inch from the angle of the mouth, the thickened and vascular structures were freely divided, and a hard nodular surface exposed. By the aid of the gouge, elevator, and mallet, the outer wall was broken away and the denticles removed (shown in Fig. 2). In a few days the patient was considerably relieved, the spasm of the muscles of mastication subsided, and soft food could be taken with greater ease.

At the end of eighteen months he was readmitted into the hospital. A second operation was performed, and more denticles and small and dense bony masses (Fig. 2) were dug out of the cavity in the direction of the angle. Free haemorrhage followed, and the hole in the jaw required plugging for several days. In the course of a few weeks a superficial abscess formed, and fragments of necrosed bone came away spontaneously. The mouth was very carefully and constantly deodorized. Favourable changes again set in—the swelling of the face gradually diminished, the mouth could be more freely opened, and he was able to take food with comfort. Fig. 3 exhibits the appearance of the patient in 1899.

During the next three years gradual improvement took place, but marked disfigurement continued. The third operation was then undertaken for the purpose of improving the outline of the face by reducing the projecting and thickened surface of the maxilla. The swelling was freely exposed by an incision under the lower border of the jaw, and after elevating the periosteum several plates of bone (Fig. 2) with the prominent edges were removed with the saw.

The patient called to see me a few weeks since. He is now in sound health, and is doing a good business as a decorator. He is able to open his mouth with ease, and the teeth can be separated nearly an inch and a half. He can masticate on both sides; on the right side there is still a bony cavity, large enough to hold a small marble. The appearance of the patient in June, 1907, is shown in Fig. 4.

Structure of two of the Denticles.

I am indebted to Mr. S. G. Shattock for the following report:

The two denticles selected for microscopic examination were of flattened oval form and measured each 7 mm. in the longer diameter. The structure is alike in both. The material composing them consists of cement traversed by irregular channels, like Haversian canals. There is no trace of enamel at any part of the surface, and nowhere any dentine. The lacunae and canaliculi are very coarse and conspicuous, and the lamination of the bone very evident.

Only two small denticles were examined, and it is very probable that in some of the larger denticles traces of enamel or dentine could be discovered.

ABNORMALITY OF THE TEETH.

The teeth of the patient present many irregularities, which are the results of the defective development of the maxillae during embryonic life.

The alveolar arch of the upper jaw is both small and contracted (Fig. 5, *c*, *d*). The right molars, bicuspids, and canine are in their normal position. The lateral incisor, attended by a supernumerary tooth, is seen in the centre, causing the displacement of the central incisors to the left, together with the lateral incisor and canine. The left molars are altogether absent, and the bicuspids occupy their position in the jaw.

The original position of the tumour is indicated by the cavity on the right side of the lower jaw (Fig. 5, *a*, *b*); one molar and one bicuspid have been extracted on the left. The incisors and canines are badly-formed teeth, very irregular, and crowded together on the bone. On this side the only wisdom tooth in the mouth has duly appeared, and this fact clearly indicates that the follicles of all the absent molars were arrested at a very early period of their formation.

The permanent molars do not come forth in the place of the temporary teeth, but a position is gradually prepared for them by the growth and expansion of the jaws.