by radiant heat, steam inhalations, and rest was continued. On December 6th both sphenoidal sinuses were washed out with warm normal saline, and the patient at once noticed a remarkable improvement in his vision. Two days afterwards Mr. Treacher Collins reported:

"Vision of left eye = 6/18. Still much swelling of the optic disc. White lines in the retina to the outer side of the optic disc."

Progress.—Daily lavage of both sinuses was continued, clotted yellow pus being expelled. On December 20th the radiant heat baths were given up; the patient was sent out into the fresh air, and the washing of the sinuses was continued every two or three days. The discharge was examined bacteriologically and reported to contain—

"a large number of Gram-negative bacilli with a small number of cocci and diphtheroid bacilli. On culture these proved to be the pneumobacillus of Friedländer, *Staphylococcus aureus*, and a diphtheroid bacillus of the Hoffmann type."

Progress was continuous. By January 2nd Mr. Treacher Collins reported:

"Vision of left eye = 6/9 partly. Swelling of optic disc = 1.5 D. Two white dots now only seen in retina."

By January 16th he thought the swelling of the disc was less, and no retinal changes.

Cure.—By February 17th his report was as follows:

"Vision of his left eye is now better than that of his right. With -0.5 cyl. 90° he sees part of 6/6 and reads J.I. fluently. His field of vision shows only very slight contraction up and in (vide Chart 2). The swelling of the optic disc has subsided, but it still presents rather ill-defined margins, and has a filled-in appearance, no sign of physiological cup showing. The retina is quite clear."

The sphenoidal cavities had been washed out at decreasing intervals, and their interior had occasionally been painted with 25 per cent. argyrol. All suppuration in them has now ceased, the greenish-yellow post-nasal discharge has disappeared, and, as a result, the patient has gained in weight and feels better than he has done since the war.

In 1906 I published two cases in which I was able to demonstrate by *post-mortem* examination that ophthalmic complications (hazy discs and diplopia in one, with optic neuritis and complete ophthalmoplegia in the other) were due to suppuration in the sphenoidal sinuses.¹ This led me to a study of the literature of the subject, and I was surprised to find no fewer than forty other cases in which it had been shown by *post-mortem* examination that sphenoidal sinusitis had been the cause of cerebral death. Many of these cases had been accompanied by orbital or ophthalmic symptoms, and changes in the fundus had been noted in half of them. Fortified by this research I ventured to urge that "in all cases of apparently inexplicable retinitis, papillitis, and optic atrophy the nose requires exploration."

In the eighteen years which have since elapsed I have had a good many cases referred to me. In the majority, I must confess, I found no symptoms of suppuration in the sphenoidal or other accessory sinuses to explain fundus changes. On the other hand, in cases of affection of the orbit (so-called "orbital phlegmon," unilateral proptosis, etc.) the *causa causans* could, in the large majority of cases, be found in the nose or its accessory sinuses.² This led to my forming the opinion that while the nose was frequently the source of orbital affections, yet retinitis, papillitis, and optic atrophy were only rarely caused by sepsis in the accessory sinuses. In this opinion I was confirmed by certain cases of retrobulbar neuritis in which I opened the sphenoidal sinuses and found them free from suppuration. The observation that, in many of these cases, the neuritis disappeared only made me think that the cause of it must have been elsewhere. I did not think of claiming the cure as a consequence of opening a healthy sinus.

But, lately, other views have been put forward. It is now held that "the mere presence of pus in the sinuses may undoubtedly be the cause in some instances, but is by no means the usual or only one"; that "in only a small percentage of cases has pus been found"; and that "deflected septa with crowding of the chronically enlarged middle turbinate are the most usual findings."³ We are even assured that "poor ventilation and faulty drainage are all important predisposing factors," and that "it is futile to longer believe purulent sinus disease the one and only etiological factor."⁴ Quite recently nine cases of retrobulbar neuritis were treated by sphenoidal drainage.

In only one case (sixteen months' duration) no improvement had resulted. Yet in only two out of these nine cases was pus found.⁵

These and similar records would seem to warrant the exploratory opening of the sphenoidal sinuses in cases of retrobulbar neuritis, even in the absence of evidence of suppuration in these cavities or the neighbouring ethmoidal cells—when no other cause for the retinitis can be found, and the patient is threatened with blindness.

To suggest the opening of healthy accessory sinuses is a doctrine not altogether free from danger. I have been associated with cases of retrobulbar neuritis which recovered without operation on an accessory sinus and without any definite diagnosis of the cause of the condition. I would like to learn more of the disease from ophthalmologists and to hear from them what is the usual prospect of recovery. It seems a subject very suitable for a joint discussion from this point of view.

In any case, there can be no question as to our duty in opening and draining suppurating sphenoidal sinuses when associated with optic atrophy. In the case reported above operation was strongly recommended by two distinguished ophthalmic surgeons, and it had a double benefit—it averted blindness, and cured the patient of a chronic suppuration which had been poisoning him for some years.

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CYST OF THE RIGHT SUPRARENAL CAPSULE REMOVED BY OPERATION.

BY

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(With Special Plate.)

AN operation for the removal of a cyst of the suprarenal capsule is a rare procedure, and a cyst of this organ large enough to produce pressure symptoms is very uncommon; the following case, therefore, seems worth recording.

In August, 1921, I saw, with Dr. Wortley Quait of Mundesley and Dr. Burton-Fanning of Norwich, a lady, aged 49, who for many years had suffered from "indigestion." The trouble had been much worse for the last five years and was mainly characterized by pain in the back passing round the waist to the epigastrium. The pain had no relation to meals, and would often come on at night, when a little food would bring relief. Of late the diet had chiefly consisted of fish and milk foods, and there had been much flatulence and some loss of weight. The patient had been backwards and forwards between this country and the tropics for twenty years, and often when abroad she would be quite free from indigestion troubles for six months at a time. For the last six weeks there had been frequent vomiting, but a week might pass without any sickness, and after such an interval the patient would bring up a considerable quantity. There had never been haematemesis. Constipation had been very troublesome. The stomach was seen to be distended and visible peristalsis was present; there was no tenderness anywhere and no tumour could be felt. An x-ray examination showed that even after eight and a half hours a bi-smuth feed had not entirely left the stomach.

First Operation.

The abdomen was opened and an old ulcer of the first part of the duodenum, just beyond the pylorus, almost encircling the bowel and narrowing it, was found. The stomach was dilated and hypertrophied. A posterior gastro-jejunostomy was performed and the appendix removed. The gall bladder was healthy.

During the examination of the abdominal contents a large cystic tumour was found in the right hypochondrium occupying the concavity of the diaphragm and pushing the liver to the left and downwards, so that the gall bladder was in the middle line of the body and the edge of the right lobe of the liver on the level of the umbilicus. The kidney was displaced downwards, but the cyst was only slightly attached to the upper pole of this organ. At the conclusion of the gastro-jejunostomy it was deemed advisable to defer the removal of the cyst, and the abdominal wound was therefore closed. The patient made a satisfactory recovery from the operation, and examination of the right side of the abdomen a few weeks later did not reveal any abnormal swelling

FIG. 1.—Cyst as seen from the front. The yellow nodules described in the text are seen scattered over the cyst wall, and some of them are marked with crosses. The main mass of the suprarenal capsule is at the upper part of the photograph on the left side.

FIG. 2.—Section of cyst wall, low power. There is a layer of fibrous tissue on the outer and inner sides of the section. In the outer half of the wall are seen the glandular cell elements. The inner surface of the cyst at the bottom of the photograph is lined by a layer of flattened cells. Blood vessels are seen cut across in the wall of the cyst.

FIG. 3.—Section of portion of the thickness of the cyst wall under a high power, showing adrenal cells; many have degenerated.

SIR G. LENTHAL CHEATLE : EARLY AND CURABLE DISEASE OF THE BREAST.

FIG. 1.—Photograph of a plugged mammary duct outlet. A is a sebaceous gland, the duct of which can be seen opening into the mammary duct outlet. A1 is another sebaceous gland. B marks the opening of the duct outlet on the surface of the nipple. C is the duct opening into its outlet: the lumen of the duct is clearly seen to be quite patent.

FIG. 2.—A lower power drawing from a section showing a mammary duct A, and its outlet on the surface of the nipple. Sebaceous glands are opening into the duct outlet. There is here seen to be a perfectly clear pathway for many kinds of irritating agents. The dilatation at the outlet is normal. B shows another outlet to the subadjacent duct C.

in the right hypochondrium. The cyst appeared to be wholly in the hollow of the diaphragm and could not be felt below the costal margin during inspiration.

Second Operation.

Three months later the patient was again seen, as she had been complaining of distension and sense of pressure in the right loin, and by this time the right side of the abdomen was distinctly fuller than the left and dull on percussion. A large, smooth, ill-defined swelling could just be detected coming down from under the right costal margin on inspiration, and the right kidney could be felt in the iliac fossa.

With the patient on the left side an incision was made below the twelfth rib and the cyst exposed. To assist in its removal it was tapped, and was then peeled off from the surrounding tissues, to some of which, notably the peritoneum and the tissues in the neighbourhood of the vertebral bodies, it was very adherent, so that enucleation took a considerable time. The cyst separated easily from the kidney and it was not adherent to the liver. A very large cavity was left, occupying the arch of the diaphragm behind the peritoneum, which was not opened. Temporary drainage was allowed for and the rest of the wound closed.

Convalescence was uninterrupted, but at the second operation it was felt that, in view of the very firm adhesions of the cyst wall to its surroundings, it was fortunate that the removal of the cyst had not been attempted at the time of the gastro-jejunostomy.

Examination of the Cyst and its Contents.

The cyst contained two and a half pints of thin, amber-coloured, odourless, turbid fluid, which was neutral in reaction and became solid on boiling owing to its albuminous contents. It was estimated that the cyst, before tapping, measured 9 by 6 inches; the wall varied in thickness from one-eighth of an inch to that of a sheet of writing paper. The outer surface was smooth except where the adhesions had been dense, and irregularly distributed on the surface, especially over the lower part of the cyst, were slightly raised yellow nodules varying in size from a quarter to a sixteenth of an inch, which can be seen in the photograph (Special Plate, Fig. 1). Similar nodules have been noticed on cysts of the suprarenal capsule removed by other surgeons.

The inner surface was rather rough, yellowish-pink in colour, and, in places, covered with a white sebaceous-looking material. Some of the fluid from the cyst was forwarded to the Clinical Research Association so that it might be tested for adrenaline. The report received was as follows:

"We have carried out the only tests which, as far as we can ascertain, will assist in confirming the epinephric origin of the cyst. Chemically, the phosphotungstic acid test gives a faintly positive reaction for adrenaline. A similar positive might be given by uric acid. But by other tests both this substance and urea have been proved absent.

"The physiological tests (ciliary reaction and direct application under the microscope to the vessels of the mesentery of a pithed frog) both give a definitely, if weakly, positive reaction when the fluid is used. There is, in both instances, a specific sympathetic stimulation evidently due to some constituent of the fluid. As controls in these last experiments normal saline and a 1 in 5,000 solution of adrenaline were used, and we think there is considerable evidence that adrenaline is present in small amount of the cyst fluid. There are no cytological abnormalities, a few leucocytes and very occasional red blood cells only being present."

Sections of the cyst wall were made through some of the yellow nodules, and I am greatly indebted to Dr. Donald Hutchinson of Lowestoft for the beautiful microphotographs here reproduced. The section of the cyst wall under a low power (Fig. 2) shows adrenal cortical cells embedded in its outer half. There is a fibrous layer in the cyst wall externally and internally, and the inner surface is lined by a layer of flattened cells. The high power (Fig. 3) shows that many of the glandular elements in the cyst wall have degenerated.

Doran, in 1908, described a case of cyst of the left suprarenal capsule, in a woman of 62, which he removed by operation. The tumour was over 4 inches in diameter and contained about half a pint of thick blood-stained fluid. The specimen is in the Royal College of Surgeons Museum, where one or two similar specimens can be seen. He gives references to cases recorded in literature up to that date; further references are found at the end of this paper.

The size of these cysts varies considerably: Rolleston described one of the size of a cherry, and in Hartwell's case three quarts of dark reddish-brown fluid were removed.

PATHOLOGY.

Much has been written as to the true nature of cysts of the suprarenal: cystic adenomata, glandular cysts, serous and lymphangiomatous cysts, cysts depending for their origin on a primary haemorrhage into the gland (pseudocysts) have all been described. Terrier and Lecène give a useful classification in their paper. It is difficult to be positive as to the exact method of origin of the majority of these cysts as, when removed, they are often of large size.

Unless haemorrhage takes place into adrenal cysts in the course of their growth, the fluid will be found to be of an amber colour, as in the present instance; but, according to the records, haemorrhage occurs very frequently as these cysts increase in size, and this accounts for the dark reddish-brown contents usually found. Partly decolorized clots are often found adherent to the inner surface of the cyst. Haemorrhages into the adrenals have been found in the newborn, and Beadles has described extensive haemorrhages into these glands among inmates of asylums. Cysts of the suprarenal are found in the lower animals. It is well known that persons can remain in apparent good health in spite of the loss of one suprarenal capsule.

SYMPTOMS.

Unless haemorrhage occurs into a suprarenal cyst it may grow until it reaches a considerable size before giving rise to any symptoms which cause a patient to seek advice. There may be only a sense of fullness in the side or vague dyspeptic symptoms without any pain; but, if haemorrhage takes place, then pain may be very severe and the patient may become seriously ill. The rate of growth may be very slow unless haemorrhages recur.

DIAGNOSIS.

These cysts are most likely to be confused with tumours or enlargements of the kidney. It is remarkable how they tend to remain under cover of the costal margin in the hollow of the diaphragm until of large size, when they may be detected by palpation during inspiration. The kidney may often be felt below the cyst and then the diagnosis is much less difficult. Mobility from side to side is greater than from above down, and, as the cyst enlarges, it pushes the kidney downwards. A right-sided cyst pushes the liver towards the left; a left-sided one displaces the spleen and the tail of the pancreas. The size of the suprarenal may be so large as to extend across the abdomen to beyond the middle line and to reach downwards to the anterior superior iliac spine; the colon is pushed forwards, and the lower ribs may be bulged outwards. A hydatid cyst of the left lobe of the liver should be easily diagnosed from a right-sided adrenal cyst. One of the right lobe may cause great difficulty in diagnosis unless suppuration in the hydatid occurs, when other symptoms may arise which will make the diagnosis clear. A hydatid cyst of the spleen is much more mobile than a left-sided adrenal cyst. A pancreatic cyst is usually more centrally placed in the abdomen, and pathological examinations of the urine and faeces should aid the differential diagnosis.

TREATMENT.

Complete removal of the cyst is the right treatment to adopt and can usually be carried out. Some surgeons have explored these cysts through an incision in the rectus muscle or through one parallel to the costal margin. Difficulty has then been experienced in detaching the cyst wall from the structures in the neighbourhood of the spine, where it is usually most adherent. In these circumstances, after the removal of the anterior portion of the cyst wall, an attempt has been made to drain the posterior part through the anterior incision, with, in some cases, disastrous results because the attachment of the cyst to the edges of the incision has broken away.

Most surgeons who have tried a lumbar incision below the twelfth rib, as used for exploration of the kidney, have been quite satisfied with it, and I would suggest that it is the best to use. It can be extended forwards as far as necessary and, if thought desirable, the twelfth rib can be removed, as is not infrequently done in the course of a difficult kidney operation.

Evacuation of the cyst materially assists enucleation, and the lumbar incision then gives ample room and a full view during the dissecting away of the deeper portion of the cyst wall, which is the part of the operation where serious difficulty may be encountered.

Further, if for any unforeseen reason, such as dense adhesion to very important structures, or a sudden serious

condition of the patient, the deepest part of the cyst wall cannot be removed, then drainage through a lumbar incision presents no difficulty.

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EARLY AND CURABLE DISEASE OF THE BREAST.

BY

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(With Special Plate.)

SINCE the publication of my article on the proemial breast in the *BRITISH MEDICAL JOURNAL* of June 3rd, 1922,* I have gained valuable information on the interpretation placed upon it by many of my readers. They have asked whether the breasts of patients whom they have sent to me were in what I termed the proemial state. From them I have been able to select instances of diseased breasts in stages which, under proper treatment, can be saved from becoming examples of the established proemial condition.

The most typical conditions of an early and curable disease are exemplified in one of my own patients. She was 26 years old, single, by occupation a saleswoman. At the time of the consultation her tongue, teeth, tonsils, bowels, and urine were normal. The breast had not been injured by a blow, and her stays were not high enough to touch it in any position which she assumed. The left breast was normal. She had complained of pain in the upper and outer segment of the right breast for three and a half months; the pain was increased at the time of her periods.

Palpation revealed an irregularly swollen duct which could be traced from the ampulla in the areola region to the part towards the periphery, where the gland was more tender than elsewhere. On observation of the nipple three minute raised yellowish dry spots could be seen, situated at the upper and outer margin of the nipple, and I concluded that probably one of them was the exit of the duct which belonged to the affected segment of the breast. I believed them to be points of exit of ducts which were plugged with dry epithelium and excretions, either from the breast or from the sebaceous glands which open into the outlet of the duct (Special Plate, Fig. 1). Acting on this belief I advised the woman to carry her arm in a sling and to put hot fomentations on the breast; but the most important part of my treatment was to make sure that she constantly soaked the nipple with hot sterilized water applied with cotton-wool. This treatment was continued for fourteen days until the plug in the outlet of each duct was macerated enough to enable me to remove it by wiping away the film that covered it, and by gentle pressure to squeeze it out. In two months the breast gradually became normal. I then advised her to keep the nipples clean always, by means of the same process, and to avoid all kinds of soap, powder, methylated spirit, hydrogen peroxide, and so on, for fear of irritating or plugging afresh the outlets. If soap be not properly washed away it dries and cakes and fills the outlet. In addition to this it must be realized that soaps are irritating and some brands more so than others.

My interpretation of the state of affairs in this woman's breast was as follows. The presence of the plug was detrimental in many possible respects—for instance, as an irritant it might have encouraged the local action of non-virulent micro-organisms upon the epithelial lining of the duct outlet, and in consequence the whole duct might have suffered a mild infection, or the products of a mild infection might have been disseminated in the same directions. The observations of Mr. A. J. Walton in 1914 and 1915¹ and those of Dr. A. H. Drew² suggest another possible explanation—that the products of epithelial irritation created by the plug in

the duct outlet caused changes in the epithelium throughout the distribution of the duct and acini. My belief is that the change was probably a desquamative hyperplasia of epithelium which distended this duct and caused the woman pain. I further believe that similar treatment applied to the breast in this early stage of disease will prevent it from becoming an established proemial breast. Thus the prevention of disease in the care of the breast can be taken a step further back than the proemial state.

Many authorities seem able to connect changes in a sebaceous gland with plugging at the outlet of its duct, but do not seem able to connect changes in the breast with a plugged outlet of a mammary duct. I do not understand why there should be this difference, and it is all the more incomprehensible when it is realized that many sebaceous ducts open into the outlets of a mammary duct (Fig. 2), so that any detrimental discharge from these sebaceous glands would open direct into the mammary duct at this point. In addition to this anatomical feature, there is this fact: in a previous article on cysts and primary cancer in cysts of the breast,³ I pointed out the consummate ease with which foreign material is distributed throughout the ducts of the breast when once entrance be gained. Further, to show what a definite pathway for entrance there is, I draw attention to the anatomical section in Fig. 2, which shows a complete duct in the nipple and the outlet on the surface. The duct lumen is seen distinctly throughout its course. The duct widens at its outlet, into which enter the openings of many sebaceous glands. To all intents and purposes each duct system of the breast may be regarded as a separate gland. This notion may create a doubt in the minds of those authorities to whom I have alluded.

It is essential that women should keep these duct outlets free from plugs. I say this for another reason: I have in my possession whole sections of a breast affected with the earliest Paget's disease of the nipple I have seen. Only half the top of the nipple is affected by the disease. There is no carcinoma in the deeper parts of the breast. The main focus of the disease is in a plugged duct outlet, from which the process is spreading into the duct and on to the surface of the nipple. Epithelial cells are invading deeper tissues and have entered lymphatic vessels. It is a typical case of Paget's disease of the nipple, and this section, together with many other reasons, convince me that Paget's disease of the nipple is carcinoma from the beginning. This is another investigation, on the writing of which I am at present engaged. I mention it here to emphasize the importance of keeping duct outlets clean and free from irritating agents.

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³ *British Journal of Surgery*, vol. viii, No. 30, 1920, Figure 113.

POLYTHELIA.

BY

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CASES of polymastia (supernumerary breasts) are not uncommon. Goldberger¹ makes mention of some 262 such cases. Williams (Baltimore)² says: "Probably one in every few hundred women has one or more accessory breasts," and points out that the condition is usually regarded as an atavistic reversion, though it is not associated with any increased tendency towards multiple pregnancy. Ahlfeld,³ on the other hand, holds that the distribution of the mammary tissue is to be attributed to the transference at an early period of development, by means of the amnion, of some of the cells which ordinarily go to form the breasts to other

* See also the *British Journal of Surgery*, April, 1923, p. 436.