has since been noted at interviews on Jan. 23rd, April 14th, and July 20th of the present year.

The passage into the "composite" state thus supervening upon the development of another disordered condition may rapidly run on to the production of coma. The following is a case in point.

CASE 19.—The patient was first seen in March, 1898, when she was 67 years of age. The absence of sugar was easily susceptible of being maintained by limitation of starchy food. There had never been any indication of the presence of diacetic acid and on Sept. 20th, 1901, its absence was noted. In November the patient took cold and became the subject of bronchial trouble and of a severe attack of muscular rheumatism affecting the back of the neck and shoulders and giving rise to an extreme amount of distress. On Dec. 2nd the urine contained 31 per 1000 of sugar, diacetic acid corresponding with +++ and acetone ++. On Dec. 9th the following condition was found: Sugar by copper reduction, 45 per 1000; by polarimeter, 38 per 1000; diacetic acid, +++; and acetone, +; a trace of albumin was also present with the distinctive casts associated with diabetic coma. The patient died in a comatose state on the following day.

In the cases that have been alluded to the "composite" state has arisen with the occurrence of a supervening malady. If the "composite" state should already exist the supervention of another malady upon it is attended with the greatest danger and thus the insecure tenure of life known to be associated with advanced diabetes is in part to be accounted for. The following is an illustrative case.

CASE 20.—The patient first fell under my notice in June, 1901. He was then 53 years of age and had been for many years the subject of diabetes. Sugar was found to the extent of 21 per 1000 and a certain amount of diacetic acid was present. I was asked to see him on March 3rd, 1902. He had just arrived from abroad and had contracted influenza from the inmates of the house at which he was staying. The examination of his urine revealed the following condition: Sugar by copper reduction, 41 per 1000; by polarimeter, 30 per 1000; diacetic acid, +++; acetone, +; and albumin in decided amount accompanied with numerous casts. Two days later the patient died in a comatose state.

The information given by the acetone series is of much prognostic value. Indeed, the knowledge they supply in connexion with a case furnishes an insight into the future which cannot be obtained by looking solely to the sugar. Sufficient already has been said to show that it is not to be concluded that their presence is indicative of imminent fatality, but at the same time their presence to a pronounced extent and without any outside influence to account for them must be regarded as of exceedingly bad augury. Weintraud¹ states that he noticed the presence of diacetic acid in one of Naunyn's cases five years before death occurred. I may in connexion with this matter cite from my own experience the following case.

CASE 21.—The patient was first seen in September, 1885. He was then 48 years of age. After progressing in a fairly satisfactory manner till December, 1899, diacetic acid then showed itself in his urine. The report ran: Sugar by copper reduction, 22 per 1000; by polarimeter 22 per 1000; and diacetic acid, +. On April 5th, 1900, the following condition was found: Sugar by copper reduction, 34 per 1000; by polarimeter, 28 per 1000; and diacetic acid, ++. My next record is for Nov. 1st, 1901, when the report stood: Sugar by copper reduction, 34 per 1000; by polarimeter, 33 per 1000; and diacetic acid, +. I have not seen the patient since, and as far as I am aware he is still alive.

When the acetone series of products are discoverable to a large extent in a case it may be safely concluded that life is not likely to last long. On March 5th of this year a patient came to me bringing urine that yielded on examination the following results: Sugar by copper reduction, 61 per 1000; by polarimeter, 37 per 1000; and diacetic acid, ++++. I felt that the patient could not in this condition last long and I wrote accordingly to the local medical attendant. She died in coma 12 days after. The difference between copper reduction and polarimeter values here amounted to 24 per 1000. These are about the highest figures I have met with, and when brought into terms of actual oxybutyric acid give 53 per 1000 as the quantity present.

The following case also affords a good illustration of

the value of the information derivable from a detailed examination of the urine for the acetone series.

CASE 22.—The patient, aged 38 years, first fell under my observation on April 14th, 1902. He had noticed in the previous autumn from his Turkish-bath weighings that he was steadily losing weight and through this he sought advice when the existence of diabetes was recognised. There had been no urgent thirst or great flow of urine and the condition had not been regarded as one to call for immediate anxiety. A partially restricted diet was being followed. The full examination of the urine showed at once the grave state existing. The following were the results obtained: Sugar by copper reduction, 50 per 1000; by polarimeter, 39 per 1000; diacetic acid, +++; acetone, ++; and a trace of albumin with granular and hyaline casts. Several subsequent examinations were made which showed some fall in the sugar, but the acetone series persisted to about the same extent and the patient grew gradually worse till July 9th, when death took place.

The testing for diacetic acid is a matter of easy accomplishment and it gives a certain amount of information, but the value of the information conveyed is not to be compared to that obtained from the quantitative determination of the oxybutyric acid by the agency of copper reduction and the polarimeter. This, however, requires experience and time, but the result may be considered to repay the labour undertaken. A double process is involved. It is possible, however, by fermenting away the sugar to make the polarimeter alone serve for giving the required information. If this is done confidence has to be placed in oxybutyric acid possessing the power of fully resisting destruction during fermentation, which is doubtful.

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MYOMA OF THE VAGINA.

BY W. ROGER WILLIAMS, F.R.C.S. ENG.

CANCER of the vagina is rare, sarcoma is rarer still, and myomatous tumours are the rarest of all. Although the vaginal musculature is much thinner than is that of the uterus, in other respects there is much similarity between them, except that the former lacks the post-embryonic developmental potentiality of the latter. It is owing to this functional difference, and consequent diversity in the number and arrangement of its blood-vessels, &c., that myomatous tumours arise so very much less frequently from the vaginal than from the uterine walls. The musculature occupies an intermediate position in the vaginal parietes, between the corium of the "mucosa" and the fibrous tissue of its outer coat, to both of which it sends processes. It is most abundant in the lower part of the vagina, especially anteriorly in the vicinity of the base of the bladder; and it is significant that these are just the localities where vaginal myomata are most prone to develop. Blood-vessels, lymphatics and nerves also enter into its composition.

As in the case of their uterine congeners the precise structure of vaginal "fibroids" has been much debated; and, as Virchow long ago remarked, the reports of cases rarely enable us to determine with certainty whether we have to do with myomatous, fibro-myomatous, or merely with fibromatous formations. To a certain extent this criticism is still valid. No doubt the relative proportions in which myomatous and fibrous structures enter into their formation is very variable; but, in spite of difficulties of this kind—and the rarity with which observers have resorted to the special reagents and technique necessary for the discrimination of leiomyomatous elements—it appears that the great majority of recently recorded cases have been myomatous. This was obviously so in 19 of the 29 modern cases tabulated by Phillips. Probably future investigation will show that nearly all vaginal "fibroids" are myomatous *ab origine*.

Vaginal "fibroids" differ from their uterine congeners in their comparative rarity (only three to 1073 cases) and in that they are nearly always solitary. Instances of multiple vaginal myomata have, however, been reported by Odenin and Strassmann. Odenin's patient was a peasant, aged 32 years, who when only 18 years old had twins and subsequently one miscarriage. At several sittings no less than 16 myomatous tumours were removed from the vaginal walls.

¹ Archiv für experimentelle Pathologie und Pharmakologie, Band xxxiv.

These tumours were of variable sizes—the largest being as big as the fist, two others were of the size of hen's eggs, and the rest were smaller. Some of the tumours were stalked, others were sessile. They were circumscribed, hard, lobulated, and whitish on section. Histologically examined their structure was that of "myoma lævicellulare." In Strassmann's case two small, partially calcified, tumours were present. Leisering has met with over 20 tumours of this kind in the walls of the vagina of a dog. In cases reported by Stumpf and Strassmann the tumours were multinodular. Hastenpflug, Byford, Oliver, and Taubert have found tumours of this kind coexisting in the vagina and uterus. Schroeder and Pillore have met with the like concurrence in the vagina and ovary, while Virchow has described an instance in which the vagina, the uterus, and the ovary were concurrently affected. An instance of vaginal myoma in an unmarried woman, 21 years old, who was the subject of double uterus and vagina, has been reported by Emmet. Most vaginal fibroids are of intra-peritoneal origin, springing from the musculature, but exceptionally they arise in neighbouring tissues (paravaginal). Aberrant uterine myomata, sequestered from their original matrix, sometimes acquire a paravaginal *habitat*. The great majority of vaginal myomata originate anteriorly; this was the condition in 25 of Kleinwächter's 39 cases and in 23 of Phillips's 29 cases. Veit believes that many myomata originate in connexion with Wolffian "rests." In support of this view Pick has described a remarkable myomatous tumour of the posterior vaginal fornix which contained epithelial lined tubules similar to those found by Recklinghausen in uterine myomata. Krönig and Poupinel have also met with structures of this kind in tumours of this vicinity. At an early stage of development the vaginal "fibroid" presents as a small, hard, circumscribed, mobile tumour in the vaginal wall. As it increases in size it usually tends to project into the vagina, being covered by its muco-cutaneous lining membrane. The tumour is at first sessile and it may continue so, but more commonly it gets involved in the vaginal lumen and so acquires a pedicle which is generally short and thick. Sometimes, however, the pedicle undergoes such elongation as to admit of the "fibroid" hanging from the vulva, and large tumours have been known to reach even as low as the knees, of which Paget has cited instances. The implantation area of large tumours is generally well supplied with blood-vessels, which may bleed freely when divided.

Vaginal "fibroids" increase slowly, several cases of over 12 years' duration having been reported, but they seldom attain large size. When first noticed they are commonly no bigger than a hazel-nut or a walnut, but specimens of the size of a child's head and weighing over 10 pounds have been met with. Large tumours cause great distension of the vagina and by their bulk interfere with the functions of adjacent organs, such as the bladder, the rectum, &c. These large tumours constitute a serious malady, but the small ones seldom cause any special inconvenience. Extruding tumours are apt to be complicated by inversion of the vagina, and in displacements of this kind the bladder or rectum may be involved. Such tumours may even separate spontaneously and be expelled per vaginam, of which several instances have been reported. In their morphological characters vaginal myomata resemble their uterine congeners, as they are generally encapsuled, circumscribed, nodulated, and of dense quasi-fibrous texture. Softish varieties are, however, met with which may be telangiectatic or lymphangiectatic, as in cases reported by Boutin, Hofmokol, Flunderberg, and others. Calcification is rare, but instances have been reported by Taubert and Strassmann.

By far the commonest of the superinduced changes met with in these tumours are those that result from *septic infection*—viz., congestion, œdema, inflammation, necrosis, and gangrene, which are usually consequent on some form of injury. Salpingitis, pyosalpinx, peritonitis, and septicæmia are frequent concomitants of this kind of accident.

Any form of malignant disease originating in vaginal myomata is most exceptional, but sarcomatous changes have been reported by Homs and Cartledge, and myxomatous by Kleinwächter and Péan. With regard to the age incidence, of 20 cases tabulated by me the youngest—when the first indications of the affection were noted—was 20 years and the oldest 46 years; and their mean age was 33·4 years. When these same patients sought surgical advice owing to the supervention of more or less urgent symptoms their average age was 34·6 years. Thus vaginal myomata occur

on the average several years earlier than do their uterine congeners. The age distribution of these 20 patients at the onset of the disease was as follows: from 20 to 30 years in six cases, from 30 to 40 years in nine cases, from 40 to 45 years in three cases, and from 45 to 50 years in two cases. This shows a preponderance of cases arising during the fourth decade—i.e., prior to the menopause. R. R. Smith's analysis of 69 recently reported cases agrees with this, for 40·5 per cent. of his patients belong to the fourth decade. According to Kleinwächter, however, the period of maximum liability is considerably later—viz., at about the time of the menopause. It is alleged that these tumours may be congenital or appear during early infancy, but anyone who cares to study the reports of the cases commonly cited in support of this statement—viz., those of Martin, Traetzel, and Wilson—will see, as I have elsewhere pointed out,¹ that none of the polypoid formations in these cases were really of the nature of myomata. A considerable proportion of those affected with these tumours are single and among the married the ratio of sterility is in excess of the normal. Vaginal "fibroids," even when of some size, seldom cause menorrhagia or other menstrual derangement, for of R. R. Smith's 69 cases menorrhagia was noted only in seven. Irregular hæmorrhagic vaginal discharges are occasionally met with (15 times in 101 of R. R. Smith's cases). The liability to conception is but little affected, hence the tumours are often concomitant with pregnancy, and instances of dystocia from this cause have been reported (Pelletan, Gensoul, McClintock, and others). In McClintock's case the tumour was gangrenous. The projection of the tumour at the vaginal orifice is usually the first indication of the disease, and it is for this rather than for special symptoms caused by the tumour that most patients first seek professional advice. Painful and difficult micturition, with blood-stained urine in some cases, are among the early symptoms, and at a later period there may be retention of urine, but this is rare except with large tumours. Difficulty in defecation may also occur but severe obstruction is very exceptional. Leucorrhœal discharge, painful coitus, lumbo-sacral pain, and sanious discharge are also among the initial symptoms occasionally observed. At a late period the surgeon is often consulted on account of inflammation and necrosis of the tumour as well as for its troublesome bulkiness.

In making the diagnosis of vaginal tumours it is well to recollect that this part of the body is prone to originate localised invaginations and prolapses (cystocele, rectocele, enterocele, &c.) which at first sight often present a certain resemblance to myomatous and other tumours, cysts, &c. In displacements of this sort the bladder and urethra are often involved while the rectum generally escapes. Vaginal displacements are especially apt to occur during labour complicated by the presence of vaginal tumours. Cysts of the part, especially when circumscribed, thick-walled, and tense, may closely simulate vaginal myoma. Usually, however, vaginal myomata are easily diagnosed. Myomata of any size, especially when they interfere with natural functions or present signs of septic infection— inflammation, œdema, sloughing, &c.—should be removed. Similar treatment is required for tumours that have been extruded from the vulva or that obstruct the vaginal outlet. Aseptic technique should be observed.

In dealing with polypoid tumours if the pedicle is of no great thickness, and accessible, it should be transfixed, ligatured in two places, and divided between the ligatures. Before effecting division it is well to ascertain that no diverticulum of the vagina, bladder, or rectum is involved in the pedicle. In all other cases enucleation is the best method of treatment. The bladder and rectum having been evacuated the vaginal walls are separated by retractors and the tumour is seized with the toothed volsella and brought into view. Should it be very large and the vagina narrow vaginal *débridement* may be necessary. For anteriorly situated tumours the catheter is retained in the bladder to guard against injury of the urinary tract, while a deep and free incision is made into the presenting part of the tumour, laying open its capsule. With the handle of the scalpel, an enucleator, or other suitable blunt instrument the tumour is gradually separated from its bed and removed. To effect this with large tumours morcellation may be necessary. During the enucleation of posteriorly situated tumours a guiding finger or bougie should be kept in the rectum. The hæmorrhage attending the removal of

¹ British Journal of Obstetrics and Gynæcology, April, 1902.

vaginal myomata is often free. Bleeding points should be seized with pressure forceps and ligatured. The redundant margins of the tumour-bed having been resected deep sutures are passed with a handled needle so as to close the gap and at the same time to surround and compress the bleeding areas. The closure of the wound is then completed with superficial sutures. Finally, the vagina is lightly packed with iodoform gauze. In exceptional cases it may be necessary for the arrest of hæmorrhage to gauze-pack the bed of the tumour. Tumours of this kind concomitant with pregnancy should not be interfered with unless they seem likely to cause dystocia or unless they have become septicly infected, sloughy, &c., when they should be promptly removed, the pregnant uterus being interfered with as little as possible.

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A CASE OF SADDLE-NOSE TREATED BY SUBCUTANEOUS INJECTION OF PARAFFIN.

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A MAN, aged 20 years, gave the following history. At the age of 14 years he had an injury to the nose which resulted in an abscess of the septum. This was treated but in the process of healing it was noticed that the bridge of the nose became depressed and the final result is shown in Fig. 1. This photograph was taken at the request of a

FIG. 1.

Before operation.

surgeon who proposed to 'correct the deformity by operation. Nothing was, however, done at this time and the nose remained in the same condition until the patient was sent to me recently by Dr. R. Marsh. When I saw him there was a typical saddle-nose deformity, the profile view of which is shown in Fig. 1. In the front view the deformity was not quite symmetrical, there being a depression over the situation of the extremity of the right nasal bone. The case appeared to be a favourable one for treatment by the paraffin method, as the skin was thin and easily pinched up between the finger and thumb and there was no scar tissue.

The patient was chloroformed by Dr. Marsh as he appeared to be of a nervous temperament and it was not certain how much pain would be caused by the injection

of the hot fluid. The sterilised paraffin used was prepared by Martindale and had a melting point of 110° F. About half a drachm was injected by means of an ordinary antitoxin syringe, the above-mentioned depression being selected as the point for the insertion of the needle. The nose was then moulded into shape. For four or five days there were considerable cedema and redness of the nose, but there was no pain. These subsided under cold applications, leaving the nose in the condition shown in Fig. 2. In the front view the nose is now symmetrical, but of course it is still as broad as before.

FIG. 2.

After operation.

Remarks.—The anæsthetic was probably unnecessary, but a case has been reported in which severe pain was caused by the procedure when performed under local anæsthesia. With regard to the melting point of the paraffin used, at first a paraffin of low melting point—e.g., about 104° F.—was used (Gersuny). It has been shown that this does not always give permanent results and it is found that paraffins of higher melting point—e.g., from 120° to 130° F.—are more satisfactory (Eckstein). In this case I chose a paraffin melting at 110° F., as this seemed to me to be free from most of the defects of the low-melting paraffin and easier to manipulate with simple apparatus than the high-melting paraffin. It is advisable to have a special short thick needle to the syringe. In conclusion, I would point out that patients are apt to be disappointed in the result at first, as the front view is not much affected and they cannot at once realise the change in profile.

Hove.

THE DIAGNOSIS AND TREATMENT OF MALIGNANT STRICTURE OF THE OESOPHAGUS.¹

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To put the subject of this debate briefly, it may be said that the diagnosis of malignant stricture of the oesophagus resolves itself into the passage of a bougie, to ascertain the presence of an obstruction, and the treatment in deciding the best way of introducing food. However, one sees so many cases treated for dyspepsia that it is necessary to consider a few of the early symptoms. In speaking to an audience of experts I will limit myself to what appear

¹ A paper read before the Laryngological Society of London on June 6th, 1902, in opening the discussion on the above subject.