years of life (under ten years). Combining the results of the three inquiries there were in all 9095 exposed to infection, of whom 2922 were attacked and 470 died—an attack-rate of 32·1, a mortality-rate of 2·1, and a (case) fatality-rate of 16·0 per cent. At ages under one year of 275 exposed 112 were attacked and 74 died—an attack-rate of 40·7, a mortality-rate of 26·9, and a fatality-rate of 66·0. At ages one to ten years of 2418 exposed, 852 were attacked and 235 died—an attack-rate of 35·2, a mortality-rate of 9·7, and a fatality-rate of 27·5.

2. That the attack- and death-rates at the age-period ten to thirty years most nearly approximate to the mean, but that the fatality-rate is lower. Of 3634 exposed, 1227 were attacked and 75 died—an attack-rate of 33·7, a mortality-rate of 2·0, and a fatality-rate of 6·1.

3 That the attack-rate at ages thirty years and over is lowest of all, but the fatality is higher than at the previous period. Of 2738 exposed, 751 were attacked and 86 died—an attack-rate of 27·4, a mortality-rate of 3·1, and a fatality-rate of 11·4.

4. That vaccination has a marked influence in diminishing liability to attack and to a fatal issue, an influence most apparent in early life, but obtaining in lessening degree at later periods, the rates amongst the vaccinated being always below those of all classes at the same period :—

TABLE VII.—Rates among the Vaccinated.

Vaccinated.	Attack-rate.	Mortality.	Fatality.
Under 1 year	3·2	—	—
1 to 10 years	9·3	0·2	2·9
10 to 30 years	30·6	1·1	3·5
30 years and over	27·3	2·7	10·0

5. That on the other hand, the lack of vaccination enhances the liability to attack and increases the mortality from small-pox in an infected community, both absolutely and relatively, but that the absence of this influence is less marked, at any rate, so far as regards the liability to infection, as age advances.

TABLE VIII.—Rates among the Unvaccinated.

Unvaccinated.	Attack-rate.	Mortality.	Fatality.
Under 1 year	45·5	30·3	66·6
1 to 10 years	46·5	13·8	29·9
10 to 30 years	57·5	9·4	16·4
30 years and over	29·4	11·8	40·0

6. That although great variations may exist between different outbreaks as regards the general attack-rate and mortality, irrespective of the proportion of the vaccinated and unvaccinated in the community, yet in every instance a similar disproportion exists in the attack-rate and mortality of the vaccinated and unvaccinated respectively. The comparison of the outbreaks at Leicester and Gloucester bears this out. In these two places the proportion of the vaccinated in the community invaded by small-pox was nearly the same, and a like parallelism obtained at each age-period. These proportions were also maintained amongst those attacked with small-pox, except that in every instance the relative proportion was higher of the unvaccinated amongst those attacked than it was amongst those exposed. The general attack-rates and the mortality at all and any age were notably higher at Gloucester than at Leicester. Nevertheless, in the two places the attack-rates of vaccinated and of unvaccinated were similarly disproportionate throughout.

7. That upon this it appears that (a) whether a small-pox outbreak be severe or slight, intense in its virulence and fatal in its effects, or comparatively mild and yielding a low death-rate, (b) whatever may be the local conditions or circumstances, the amount of isolation and other less obvious factors whereby the extent of an outbreak is influenced,—there still remains one feature common to all. This is that invariably the unvaccinated members are more liable to be attacked, besides yielding a rate of fatality considerably in excess of that which results amongst the vaccinated section.

8. That the disparity between the vaccinated and unvaccinated rates is considerably increased if those who were

“undergoing vaccination” when exposed or attacked be deducted from the total of the “unvaccinated,” and even more markedly (for the later periods of life especially) by a similar deduction of those who had in previous years suffered from small-pox.

EXPLANATION OF THE COLOURED CHART.

These diagrams have been constructed from the statistical data given above. They are intended to furnish a ready means of comparison between the three outbreaks in respect to: (1) the general attack-rate and mortality at all ages and in each of four age-periods; (2) the proportionate numbers (per cent.) of the vaccinated and unvaccinated at all ages and at each age-period amongst those exposed to infection; (3) the proportionate numbers (per cent.) of the vaccinated and unvaccinated at all ages and at each age-period of those attacked by small-pox; and (4) the attack-rate and mortality (per cent.) of the “vaccinated” and “unvaccinated” groups at all ages and at each age-period.

(To be continued.)

TWO CASES OF INTRACRANIAL TUMOUR.

By F. W. EURICH, M.B., C.M. EDIN.,

LATE PATHOLOGIST, COUNTY ASYLUM, WHITTINGHAM, LANCASHIRE.

INTRACRANIAL tumours form but a small percentage of the cases occurring in asylum practice. Their comparative rarity has frequently been commented upon, the more so as such an institution is the haven in which only sufferers from intracranial diseases or their results find refuge. The effects and manifestations of tumour-growth have usually been divided into those of a local and of a general nature. The former are very rarely such as to render the patient's removal to an asylum advisable, while the mental disturbances included among the latter are usually of a simple nature, such as dementia of varying degree, with or without stupor, or slight melancholia readily controllable at home or in hospital. Occasionally, however, a different tale can be told; and it is my present purpose to illustrate some of these more unusual features with the help of a couple of cases which have, among others, come under my notice as pathologist during the past year.

CASE 1. *Epilepsy (?) ; tumour of the frontal lobe.*—The first case, for the clinical notes of which I am indebted to my colleague, Mr. C. Bayley, is that of a man aged fifty-five years, admitted into Whittingham Asylum on March 28th, 1895, and who died therein on Sept. 19th of the same year. The certificate on which he was admitted states that “he has delusions of identity, time, and place; that he cannot give any connected account of himself, wanders about on imaginary journeyings, and has no idea where he is or when he came here.” Historical particulars are very scanty. He is said to have suffered from two previous attacks, but the age at which they occurred, their duration, and other details are returned as unknown. Notes as to family tendencies and previous bodily health were not forthcoming, while the man's mental condition precluded the possibility of his giving a reliable account of himself. He volunteered the statement that he suffered from fits, and the facts mentioned in the certificate could certainly be interpreted to that effect, but he could not tell how long he had been so afflicted, when they seized him, or whether he had an “aura” or not. He was distinctly demented, his apprehension being slow and his memory, for recent events in particular, impaired, but there was no sign of stupor. He presented delusions of identity, time, and place, as mentioned above, and was obstinate, bad-tempered, and passionate, displaying the common “epileptic character.” He would at times make rushes, attempting to strike those about him or to smash surrounding objects. He was careless as to his person and took no active interest in what was going on around him. When I saw him he was reading with some intelligence a weekly periodical of light literature; in conversation his sentences were well-formed and his utterance distinct, but he was sullen and showed a disinclination to talk. Particularly was there no sign of aphasia in any of its forms. Physically he was well-nourished, somewhat sallow complexioned, with dilated capillaries on the cheeks and nose, and glistening sclerotics. The pupils were contracted, reacting well to light and

accommodation. There was no optic neuritis. The reflexes were all normal; there was no motor or sensory impairment. The pulse was 70 and the respiration 19. He ate and slept well and seemed in fair general health, with the exception of a troublesome cough. His condition remained the same till the beginning of August, when the cough grew worse, a slight rise in the temperature was registered in the evenings, and he took to his bed. Physical examination only revealed the signs of chronic bronchitis. At the end of August he had an attack of hæmoptysis; he became feeble and emaciated, and his respirations became shallow and very rapid (60 per minute). Cheyne-Stokes respiration was noted towards the close and he died on Sept. 19th, 1895. At the necropsy there were found, besides chronic bronchitis, scattered patches of broncho-pneumonia, and an abscess cavity (non-tuberculous) in the left upper lobe, the following conditions:—The calvarium presented nothing of note; the dura mater was somewhat thickened and tense; on opening it the subdural space was dry and the subjacent convolutions slightly flattened. On attempting to remove the brain it was found to be attached to the floor of the anterior fossa by a tumour. Involving the dura mater and the pia mater, over the anterior and inferior aspects of the left frontal lobe, but leaving the bone untouched, the tumour had invaded the left frontal lobe penetrating as far as the head of the caudate nucleus. The falx was adherent to the mesial aspect of both frontal lobes and was likewise involved by the tumour which, passing through it, had attacked the adjacent cortex of the right lobe. The corpus callosum had also become infiltrated for about an inch. The tumour was not encapsulated and could not be shelled out; it was reddish-white, with a peculiar soft, granular aspect on section and of fairly firm consistence. The white matter of the hemispheres in its immediate neighbourhood had softened, which softening extended to the anterior edge of both optic thalami, the ependyma, which was granular, alone separating it from the cavity of the lateral ventricles. The basal arteries were slightly atheromatous; with this exception the rest of the brain presented nothing of any interest. There were no secondary deposits in any part of the body.

CASE 2. *General paralysis simulated; apparent convalescence; relapse; multiple psammomata of the dura mater.*—The second case (clinical notes of which have been kindly supplied by my colleagues, Dr. A. Simpson and Mr. R. J. Stephens) is of peculiar interest and in some respects perhaps unique. It is that of a woman, aged thirty-eight years, who was admitted into the asylum on Nov. 23rd, 1894, and died on July 10th, 1895. The reception order states that "she is sullen, morose, and stupid; she curls herself up under the bed-clothes and refuses to answer questions and to take food. She is excited at times and with difficulty restrained. Her husband is afraid that she will do away with herself." The somewhat meagre history said that she was married and had three children, the youngest one year old. Her parents died from phthisis and one brother committed suicide. She had been of temperate habits and, with the exception of an attack of typhoid fever some years ago, had always enjoyed good health. The present attack was stated to be of nearly three years' duration, consisting of progressive dementia. On admission she presented the appearance of a full, flabby-faced woman, almost suggesting œdema, expressionless, and with a generally bloated look. The pupils were contracted and did not react to either light or accommodation. There was neither optic neuritis nor atrophy. The reflexes appeared to be normal. Speech was so thick, indistinct, and slurred that even the pronunciation of her name was almost unintelligible. Muscular power was much impaired without any definite paralysis and she was sent to bed immediately after admission. Any sensory defects that might have existed could not be ascertained on account of her mental condition, though she appeared to be sensitive to pain. She was extremely fatuous and demented, lying in bed dull, listless, and uncomplaining, not seeming to appreciate where she was or to have any idea of her surroundings. She lay grinding her teeth, passing urine and fæces into the bed, and required every attention. At times she was restless. She was considered to be a general paralytic in the third stage, and the progress of the case for some time justified this opinion. From Dec. 1st to Dec. 4th she had an irregular febrile temperature, was lethargic, and could scarcely swallow. On Jan. 3rd, 1895, she had a slight epileptiform seizure affecting mainly the left side, and was more helpless and feeble. But now

a remarkable change took place; the patient began to improve. On Jan. 20th she was reported as being slightly better, but very helpless still. On Feb. 4th the note says that she smiled fatuously when spoken to and appeared to understand more of what was going on around her. On Feb. 27th she was just able to sit up and was much brighter mentally. The favourable change progressed till at the end of April she was able to get about, though her face was still expressionless, her speech still somewhat slurred, and her manner childish and demented. In June she was reported as bright and cheerful, working well in the ward, and greatly improved as regards her general health. In fact, she was considered sufficiently convalescent to be discharged to the care of her friends. General paralytics, we know, may improve unexpectedly and to such an extent that their detention in an asylum is no longer warranted; but such an improvement as this woman, presumably in the third stage of general paralysis, showed has never yet, to my knowledge, been recorded. The diagnosis was therefore re-considered, but a better one was not arrived at, for convalescence was quite as unaccountable in any of the diseases which might possibly have simulated general paralysis. She was, then, to be discharged and the diagnosis suspended *sine die*, as it were; but on June 27th, a day or two before she was to have left us, a sudden change occurred. She was noticed to be looking dazed and ill and complained of severe occipital headache. This was the first occasion, be it noted, on which headache was complained of. She was sent to bed. The temperature was sub-normal, the pulse 84, and the respirations 19. There was no vomiting. The pupils were equal and contracted and showed a peculiar phenomenon. When the lids were raised by the examiner the pupils dilated to their utmost capacity, but after a few seconds contracted, or rather collapsed, with rapidity, only to dilate again after an interval of perhaps a minute previously to again contracting. This would be repeated periodically and apparently quite independently of the action of light or accommodation. The knee-jerk was absent, but the other reflexes were normal. During the following days the headache increased in severity. It was then I saw her for the first time and observed the conditions already noted. In addition, I found her crouched up in bed moaning, with injected conjunctivæ. Sensory aphasia (?) also appeared to develop as far as could be ascertained in her condition; she was easily roused and could well express her wants, but did not seem to understand what was said to her. She became more and more stuporose; there was slight rigidity of the muscles at the back of the neck; and a few days before death loss of power was detected in the right arm and some paresis of the right side of the face, while the leg remained apparently unaffected. No convulsive seizures were noted. She rapidly became comatose; Cheyne-Stokes respiration developed, and she died on July 10th, thirteen days after the onset of acute symptoms. The post-mortem examination revealed a startling condition of affairs. The dura mater was thickened and firmly adherent to the calvarium over the left hemisphere from the Rolandic fissure backwards. On carefully opening it a large number of almost spherical tumours were found growing from its inner surface on the left side. They attained their maximum development over the ascending parietal convolution, the whole parietal lobe, the upper half of the temporo-sphenoidal lobe, and over the mesial aspect of the hemisphere from the Rolandic to the calcarine fissure, in which region they were so densely clustered as to give rise to mutual compression. They were about thirty in number, ranging in size from the dimensions of a walnut to those of a green pea, the larger variety predominating. They merely compressed the hemisphere, in no wise implicating the cortex, being only here and there loosely attached to the pia-arachnoid. The corpus callosum and the mesial aspect of the right hemisphere were necessarily somewhat compressed. Not all the tumours were so clustered together; one or two were noted at more distant sites. A few of small size were found growing from the dura mater of the base in the left middle cerebral fossa, a large solitary growth on the dura mater covering the anterior surface of the left frontal lobe, and another of the same size springing from the posterior margin of the large wing of the right sphenoid bone. The tumours, covered by a thin, tense capsule, were pinkish-yellow on section, of a soft, fibrous structure, and slightly gritty to the touch. Their attachment to the dura mater was not particularly firm, a soft, felt-like base being left behind.

The bones of the skull were not affected. The direct effects of compression of the cerebral cortex were very marked, the grey matter being often reduced to a thin, dark greyish-purple line. Elsewhere the cerebral cortex, though a little congested, appeared healthy, particularly without even a suggestion of general paralysis. The membranes stripped readily; the lateral ventricles showed no granularity or dilatation; in fact, the rest of the brain presented no obvious morbid appearances.

Widely as these two cases differ from each other they have yet two points in common. One is the predominance of mental over bodily symptoms already referred to in the introductory remarks—dementia, with more or less excitement, being the form assumed. The other is the absence of headache, of optic neuritis or optic atrophy, and of vomiting. It is, however, such a well-recognised fact that these three cardinal symptoms may occasionally be wanting that it will suffice if I record it and pass to other points in the diagnosis. The facts of the first case are scanty. The patient was a quarrelsome, impulsive dement, possibly an epileptic, though no fits were recorded during his detention at Whittingham Asylum. All signs of intracranial pressure or of a distinct focal brain lesion were absent. The existence of the Cheyne-Stokes phenomenon was practically valueless and the only suspicious circumstance was the alleged epilepsy, as true "idiopathic" epilepsy rarely develops in the sixth decade. But cortical or sub-cortical thrombotic softenings are a frequent cause of epileptiform seizures at that time of life, and this consideration, together with the general aspect of the man—the glistening sclerotics, the dilated facial capillaries, and the chronic bronchitis—gave some colour to the supposed existence of such localised areas of softening. Apart from the question of diagnosis, some interest attaches itself to the site of the growth in this instance and to the symptoms manifested by it. Epilepsy—not Jacksonian—is of not infrequent occurrence in tumour of the frontal lobe and is apparently the effect of indirect irritation and pressure; the case is another instance of this, and in this respect presents nothing unusual. Far more interesting is the relation of the tumour to the frontal lobes as the seat of the higher organs of mind. Attempts have been made to assign distinctive clinical phenomena to morbid growths in this region. Marked enfeeblement of the mental powers has been credited with some diagnostic importance, but cases have been published in which great deterioration of the intellect has accompanied tumour growth elsewhere, whilst mine shows that a neoplasm may extensively invade one frontal lobe, may involve the other together with the corpus callosum, and yet give rise to only a moderate degree of mental failure. Bruns, who, in opposition to Ferrier, Allen Starr, and others, is not inclined to attribute to the frontal lobes a greater share in the higher intellectual faculties, might cite this case in support of his views; but another interpretation seems also possible. The tumour, as microscopic examination (see later) showed, was evidently of slow growth—allowing, maybe, the more intact right lobe to compensate to some extent the lesion in the left—and might have gone on growing for a further considerable period as far as the effects produced by it were concerned, had not an intercurrent disease cut short the patient's life. Now the rapidity with which an intracranial tumour runs its course in the absence of complications will depend upon its site and nature, while the multiplicity and severity of the symptoms manifested will, *inter alia*, depend upon the rapidity of its growth. A cerebellar hemisphere may, for example, be almost totally destroyed by an abscess of gradual formation, with no symptoms to point to such a lesion. Similarly, we have to deal in the present instance with a tumour which, by slowly destroying, rather than by compressing, the nervous structures had failed to increase the intracranial pressure to any great extent. We may, therefore, consider that the tumour had reached but a comparatively early stage of its life-history at the time of the patient's death. If this be granted, then the case is of value as corroborating the opinion lately put forward by Oppenheim and others, that tumour growth in the frontal lobes anterior to the præcentral gyrus is often characterised, not by the extent of mental impairment, but by the early onset of the same, frequently even before sensory or motor symptoms become manifest. The epileptic seizures alleged to have occurred in Case 1 must not be placed in the latter category—at least, not in the sense here employed; general epileptic convulsions are in such cases not a local manifestation, but as much a general

symptom of organic brain disease as headache, vomiting, or a slow pulse. Whereas no suspicions as to the presence of a cerebral tumour were entertained in the first case matters were somewhat different in the second. For the sake of convenience we may consider the diagnosis in connexion with three distinct periods in the course of the disease—viz., on admission, at convalescence, and at the occurrence of the relapse which ended in death.

The difficulty on the first occasion lay in the intensity of the symptoms presented, while headache, vomiting, and optic neuritis were absent. True focal symptoms were also wanting, profound dementia, general paresis of the extremities and helplessness, with difficulty in swallowing and unintelligible articulation, being the most marked objective phenomena. Some fine distinctions have been drawn between the dementia of general paralysis and that of cerebral tumour; between the affections of speech in the two diseases; and between the modes of onset and the relation to each other of mental and motor symptoms. In cases of cerebral tumour the dementia is said often to assume the form of childishness; speech is said to be slow, thick, and laboured, and not so ataxic as in general paralysis, while motor symptoms are said to manifest themselves sooner than mental. Other and finer points of difference are said to exist; but, like the foregoing, they can only be of use in the diagnosis of cases not too far advanced. Progressive destruction of the cerebral cortex, whether due to a diffuse new growth or to the process underlying general paralysis, must gradually merge initial differences into the final and more or less uniform picture of loss of cerebral function. In no class of diseases is the knowledge of the mode of onset and development of symptoms so valuable as in affections of the nervous system. The paucity of historical particulars in the present instance was most unfortunate, depriving us, as it probably did, of important criteria. Two facts only in this period of the disease may be noted as exceptional if the case was one of dementia paralytica—namely, the absence of pupil reaction to both light and accommodation and the apparently normal condition of the knee-jerk. Both are uncommon in general paralysis; still, their comparative rarity was insufficient in itself to imperil the diagnosis. Then came that remarkable period of convalescence, during which the diagnosis "general paralysis" had to be re-considered. We have already stated that convalescence in the third stage of general paralysis is unknown, and that the diseases which could simulate general paralysis—namely, cerebral tumours, cerebral syphilis, "colloid disease" of the hemispheres, multiple sclerosis, lead paralysis, and other toxic conditions—all present the same difficulty. It is true that in multiple sclerosis some symptoms—e.g., oculo-motor paralysis—may disappear, and that others, such as dementia, may show some temporary improvement; but the absence of all other symptoms, such as tremors, nystagmus, &c., practically excluded it. None of the remedies deemed serviceable in some of the above had been employed, especially had mercurials and potassium iodide at no time been exhibited, treatment having been mainly expectant. Syphilis and lead-poisoning could, therefore, probably be excluded; of the latter there was, moreover, not the slightest indication elsewhere. Alcoholism was most unlikely, as she was stated always to have been temperate, as well as for other reasons. She was too young for that very rare affection "colloid degeneration" of the hemispheres, and pachymeningitis interna hæmorrhagica was most unlikely to occur at her age save as a complication of general paralysis. So only two diseases remained—general paralysis (with or without pachymeningitis) and intra-cranial tumour. Convalescence was in each case equally inexplicable, though we know that some tumours—sarcomata and psammomata among them—may undergo temporary involution under certain conditions, notably during the puerperium. There was nothing, however, to make us believe in such a remote possibility, and so the diagnosis was suspended for the time being. But on the occurrence of the relapse and the sudden onset of acute symptoms the question of diagnosis again came to the front, and the problem was to decide between an exacerbation of a hæmorrhagic pachymeningitic process, a "paralytic" seizure, meningitis of the vertex, or sudden increased tension in a cerebral tumour. The course of the disease, the steady progress from bad to worse without the occurrence of convulsions, practically excluded a "paralytic" congestive attack. No possible cause could be assigned for an acute meningitis (except a

tumour), quite apart from the fact that the temperature never rose above normal. There were thus left, as alternatives, a pachymeningitis hæmorrhagica or an intra-cranial growth. Both give rise to pressure-effects, both are of local origin, capable of causing focal symptoms, and both are liable to sudden increase in tension. If the case was one of pachymeningitis, then the possibility would gain ground that general paralysis was present after all—the third stage of that disease being simulated by the complicating meningitic process, while convalescence might have been brought about by the brain becoming accustomed to a pressure which had ceased to increase and which had possibly even diminished from some organisation and absorption of the effused blood. Whatever the nature of the brain-compressing tumour its position was clearly at or near the psychomotor areas of the left hemisphere. One fact, however, appeared difficult of interpretation: we refer to the left-sided epileptiform convulsion which had occurred some six months previously. A few isolated cases in which convulsions and paralysis have occurred on the same side as the cortical affection have, it is true, been reported by reliable authorities, but the more natural explanation in this case was to assume the bilateral nature of the lesion, differing probably in severity on the two sides, but yet in symmetrical positions. The lesion that most commonly fulfils these conditions is hæmorrhagic pachymeningitis. We therefore formulated our diagnosis to this effect: that the patient was suffering from cerebral compression, due in all probability to bilateral hæmatoma of the dura mater, complicating general paralysis. Further remarks on the case are, I think, superfluous. The only remaining point of interest would be the explanation of convalescence. The cortex of the left hemisphere—at least, a great part of it—was compressed and atrophic to such a degree as to indicate a process of some standing. The right hemisphere in all probability stepped in and gradually undertook some of the functions of the left, aided by a temporary cessation of growth in the tumour, and possibly by diminished tension; then sudden, increased vascular pressure may have rapidly brought about the fatal termination.

I have so far only considered the clinical aspect of these cases; a word or two concerning the microscopic appearances of the tumours may not be amiss. The first tumour was composed of masses of ovoid cells which were here and there arranged in strands separated by bloodvessels. It was microscopically sharply defined from the brain substance, into which it sent delicate, bud-like processes, rich in vessels, and gave us the impression of having sprung from the endothelial cells of the dura mater. The principal feature of interest was the presence of certain spherical bodies irregularly distributed throughout the tumour. They were, curiously enough, more plentiful in the younger parts of the growth, where they were frequently clustered together with just a few tumour cells intervening. Round their outer margin, which was clearly and sharply defined, one or two delicate spindle cells could almost invariably be seen and sometimes just a trace of fibrous tissue. These bodies took up various stains in various ways—some were dyed red, others yellow with picro-carmin, some light blue, others almost black by hæmatoxyline; alum carmin stained them in every shade of purple, while eosine gave them a fine pink tint. With iodine they assumed a golden yellow colour and no "amyloid" reaction could be obtained by any of the usual methods. Though the majority of these "corpora" were devoid of concentric striation, yet a goodly proportion showed it in various degrees. Calcification was not apparent. Here and there—instead of a spherical body—an elongated, curved, rod-shaped structure could be noted, fractured transversely in places and responding to staining re-agents in all respects like the former. A double process appeared to underlie the formation of these bodies; the greater number of them appeared to have resulted from a sort of obliterative endarteritis leading to occlusion of the vessel and ending in a degeneration of the inflammatory products—perhaps a form of coagulative necrosis. The other process, which, however, plays a very subordinate rôle, is a hyaline degeneration of the vessel-wall; it is limited to the periphery of a few of the bodies and forms a thin ring there. I have stated that in the older portions of the growth the tumour-cells were separated into strands by intervening vessels. This formation is much accentuated by the fact that nearly all these vessels present an advanced stage of hyaline degeneration; their walls are often ten or more times as thick as in the normal, have here and there almost occluded the lumen, and

have pushed the tumour-cells aside. In one or two places only scattered remnants of the latter have survived, and all that can be seen is a mass of hyaline material, the vascular origin of which is recognisable only on closer examination and best by means of eosine-staining of formol-hardened specimens, in which the well-preserved red blood-corpuscles are conspicuous by their brilliant scarlet. If the areas illustrating the first process were to be alone submitted for examination one would probably be inclined to name the tumour a "psammoma"; if the areas demonstrating only the last, a "cylindroma." But we have here a mixture of the two; and it would appear that vessels which have become subject to the hyaline change to any extent are exempt from the endarteritic process and *vice versa*. Why this should be we do not know and do not wish to speculate. Curiously enough, the tumours in Case 2, which were composed of long, almost fibrous spindle-cells, presented to some extent a parallel. The older growths contained a multitude of spherical bodies similar to those in the last case, but mostly calcified, and presenting besides an almost constant concentric lamination, also a delicate radial striation in some few instances. Treatment with hydrochloric acid of such bodies as were not too old revealed what appeared to be the remains of nuclei; and in the tumours of younger formation a process of obliterative endarteritis could again be noted, evidently the precursor of the "sandy" bodies. Neither in this case nor in that of Case 1 was there any evidence that the spheres resulted from the conglomeration of tumour cells. I have ventured to enter into these details as the classification and nomenclature of such tumours are still in a lamentable state of confusion. I do not pretend to say that all so-called "corpora amylacea," "corpora arenacea," &c., are the results of an endarteritis; two cases would be obviously insufficient for such a statement. But I am strongly of opinion that the terms "psammoma," "cylindroma," &c., are misleading. The structures from which these names are taken may occur in tumours of diverse characters—e.g., in mammary carcinoma, in ovarian, parotid, and omental tumours, as well as in tumours of the brain, and may even, as the first specimen showed, appear side by side in one and the same neoplasm. Those that result from endarteritis are perhaps the expression of a "senile" change in tumours of slow growth. Their greater frequency in some tumours than in others would appear to depend upon the differences in the rate of growth, which is, again, dependent, not only on the variety of tumour, but on the site of development; hence the difference of opinion whether a "psammoma" should be ranked among the sarcomata or whether it should constitute a class of its own. I am of opinion that these tumours do not constitute a special class, and that if the terms are to be used at all they should be employed in the adjectival form, such as "psammomatous sarcoma," "psammomatous glioma," "cylindromatous endothelioma," &c. "Angiolithic sarcoma," a name suggested by Cornil and Ranvier for certain forms of growths, would similarly have its advantages.

Whittingham.

TWO CASES OF ECTOPIC GESTATION IN WHICH RUPTURE OF THE SAC TOOK PLACE IN THE THIRD WEEK; ABDOMINAL SECTION IN ONE CASE; RECOVERY.

By HASTINGS GILFORD, F.R.C.S. Eng.

RUPTURE of the sac of an ectopic gestation under the age of one month is statistically very uncommon. Thus of 300 instances of this accident collected by Hecke and Cauenbirge¹ only two were at this period, one being of three weeks' duration and the other of fifteen days. Parry² out of 174 cases of rupture gives one which occurred at three weeks, and states that "the earliest period mentioned is three weeks," but afterwards goes on to say that "Rokitansky has known rupture to occur within a fortnight after conception." In the experience of Mr. Lawson

¹ American System of Gynæcology, vol. ii., p. 184.

² Extra-uterine Pregnancy, p. 174.