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ON

FOLLICULAR DISEASE OF THE SCALP.

By JAMES F. GOODHART, M.B.

THE subject of follicular disease has already received attention in a former volume of the 'Guy's Hospital Reports,' at the hands of Mr. Cock and Mr. Birkett;¹ and more recently Mr. Prescott Hewett, in an article on "Sebaceous Tumours of the Cranial Region,"² has again given some details as to its nature. On its clinical aspect, perhaps, nothing more need be said, and on that head I shall do little more than remark that a disease which puts on so many of the features of epithelial cancer, and yet if removed is of an innocent nature, needs nothing further to recommend it to the careful study of the pathologist. Its minute anatomy, however, and etiological relations are still but deficiently known from the want of more numerous detailed cases, and I have, therefore, thought it worth while to put on record, in the present short communication, the microscopical appearances of two such growths which have lately come under my notice. I am the more anxious to do this since one of the cases, apart from the interest which would attach to it as affording material for addition to our knowledge of the general characters of sebaceous tumours, has one or two features of special interest, which will repay a few minutes' consideration.

This specimen, which will be described as Case 1, is to be found in the museum of the Royal College of Surgeons, and was

¹ 'Guy's Hosp. Reports,' series ii, vol. 8.

² 'St. George's Hosp. Reports,' 1869, p. 91.

presented by Mr. Poland in 1870. The second case was also primarily under that gentleman's care, and latterly under that of my friend Mr. Davies-Colley, to whose kindness I am indebted for permission to make use of the latter part of the case.

The report of Case 1 runs thus :

Tumour on the Scalp ? sebaceous.—Edward W—, æt. 56, a publican, was admitted under Mr. Poland, January 12th, 1870. His mother had a small sebaceous tumour on her head, which burst, and soon afterwards healed up. No history of tumour of any kind except this in the family.

Twenty-five years ago a little lump appeared on the back part of the top of the head, on the right side. Until a year ago this was only the size of a walnut; since then it has been increasing, accompanied by shooting pains, which come on at intervals.

On admission.—He has a large tumour, the size of a man's closed fist, on the top of the right side of the head. It has two encrusted lumps upon it, and resembles a large sebaceous tumour. There is no enlargement of the cervical glands. Subsequently, during a fit of coughing, the tumour ruptured, and bled a good deal. He passes a good deal of albumen in his urine.

After its removal, which was accomplished by the electric cautery *écraseur*, the tumour did not present the appearance of an ordinary sebaceous tumour. It had no soft cheesy contents, and to the unaided eye the section looked like a compound gland, and in one or two places blood was effused into its substance. A fresh section, under a quarter of an inch, showed squamous epithelial cells, as well as elongated and branching ones; some very fine fibres were also seen.

Not to give a detailed report of the patient further, he went on well but for an attack of erysipelas, after which some pieces of bone were removed from the cranium, and he left the hospital with the wound healing on August 15th, 1870.

The tumour first attracted my attention on the shelves of the Hunterian Museum by the glandular appearance of the section, as described in the report above. The following is a more minute description of its general and microscopical appearances :

The growth is enclosed in a fibrous-looking capsule, which sends off prolongations into the substance of the tumour. These,

ramifying throughout it, cut it up into many roundish lobules of varying size, and give it many of the rough general characteristics of a glandular growth. Its section is cystic throughout, none of the cysts being of larger size than half to one line in diameter. Some of these are filled with soft and irregular-shaped granulated deposits; none contain any lobulated intracystic growths.

Examined microscopically, the tumour may be said to be purely epithelial; in one or two places, indeed, small local patches of round nuclei are to be seen in a faintly fibrillated stroma, but such are but few in number.

Taking, now, a single small lobule, with its enclosing capsule or fibrous septum, for more minute description, it may be said that under a $\frac{1}{3}$ th inch objective the fibre-like substance was nowhere of a fibrous character, but only consisted of homogeneous hyaline bands of substance, which, generally fatty and granular, seemed to have no definite structure.

In places the appearances rather indicated that the substance was formed by a compressed or fused epithelium, but of this I could not be certain. The point, however, to which I would draw attention is that many of the septa were not of the usual organised type, though vessels were freely distributed in them. The cells contained within each interlobular septum were epithelial, with a most regular arrangement of the cells, now extending uninterruptedly over a considerable area, now divided up into band-like processes by the occurrence of cavities in its substance. The cells themselves were beautifully regular in apposition, form, and nucleus (figs. 2 and 3); but everywhere many could be seen to be becoming greasy in their appearance, and agglomerated together for the purposes of disintegration. In this way it was evident that the cysts in the tumour had formed by a mere softening process of the central parts of tracts of epithelium, in contradistinction to the more usual form of proliferous cyst in the breast, ovary, &c., where the multiplication of cavities is brought about by the approximation and folding together of numerous papillated growths. The lining of each cyst, in most cases, assumed an obscurely fibrous aspect (figs. 2 and 3), while the contents of the cysts were no more than degenerated epithelium.

The skin at the base of the growth was much obscured in its

structure by fatty material, but when cleared up by ether the corium was found extensively invaded by an epithelial growth (fig. 1), arranged much after the manner of gland acini. It is, I think, not improbable, from a somewhat similar appearance in Case 2, that this was due to the disease attacking, for the most part, the epithelial lining of the hair-follicle. Where the epithelium had fallen out in making the sections a delicate reticulum of connective tissue was left behind, closely resembling the stroma of many of the sarcomata.

Now, in this case, the malignant nature of the growth may be fairly questioned, and if the interpretation put upon the appearance as depicted in fig. 1 be correct, then I think it may be said that no evidence existed of any tendency to recur, seeing that the tissues nearest to the growth showed no signs of participation in the disease. It is, however, open to doubt whether the locular arrangement of epithelium in the corium was not an invasion of its tissue by new growth, in fact, an epithelioma, rather than a mere hypertrophy of the follicular lining.

The history of the second case is shortly this, which I abstract from the report of the surgical ward clerk, Mr. Farrant Fry :

Anne C—, æt. 60, a married but sterile woman, without history of any similar disease in any of her family, noticed, twenty years ago, a small lump like a wart on the right side of her head, but which did not increase much till five years ago. She was then told by a medical man she had a fatty tumour between the layers of the skin. Soon after, while combing her hair, she punctured the tumour, which was now about the size of a penny, and projecting from the surface; a quantity of matter came away, and it quite healed in a few days.

Three years after the tumour came again, and has gradually increased ever since. She was told by medical men she had a cancer. She has wasted lately. I insert these details to show the changes that the tumour underwent; at first it is described as a fatty tumour between the layers of the skin, which features might very well be put on by a sebaceous cyst. Latterly it is described as a cancer.

When admitted she had an irregularly globular, somewhat flattened mass, on the anterior part of the right parietal emi-

nence, two and a quarter inches in diameter, and raised an inch from the surface. It is nodular, growing from a comparatively small base, and overlapping it, giving to the edges a somewhat everted appearance. The surface is, at parts, reddish and bleeding, at others covered with flakes, and discharging; no appreciable enlargement of the cervical glands; but there is slight nodular enlargement over the mastoid process, which the patient says was there before the tumour came.

It was considered by Mr. Poland to have been primarily a sebaceous cyst, which, after disintegration, had subsequently become a fungating tumour. In this opinion his surgical colleagues concurred.

The growth was removed, on August 2nd of the present year, by the electric cautery; and as some portions were left behind, the surface was well seared afterwards.

August 22nd.—It is noted that the growth has partially returned, growing out in the same way as before.

30th.—Two fresh masses had formed, one $1\frac{1}{2} \times 1 \times \frac{1}{2}$ inch, the other $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$ inch. Chloroform was given, and portions of scalp and growth were dissected off by Mr. Davies-Colley. She left the hospital seventeen days after this; the wound not yet healed, and with some pieces of bone to all appearance necrosed; a small sebaceous tumour had also made its appearance behind the other.

The microscopical appearances in the second case are by no means dubious, as in Case 1. The tendencies of such a tumour could not be doubted, even if we had not the fact before us that the tumour was a recurrent one. It is chiefly interesting as showing how the appearances met with in distinct types of tumour blend with each other, rendering it difficult to say that this or that growth belongs to any definite group.

The disease removed at the first operation in this case was purely a sarcoma, and very little need be said about it; the cells or nuclei were, perhaps, of rather large size—"large, round-celled sarcoma," and no trace of hair or hair-follicle could be found, even at the margin of the tumour. Fig. 4 is taken from this growth. The parts removed after recurrence are of interest, as illustrating the gradations between the forms of growth. The mass had a locular arrangement, as partially shown in fig. 5, and in some places had a gland-like arrangement, very similar to that shown in fig. 1, only that the cells were now less epi-

thelial than sarcomatous in likeness. In the skin, immediately beyond the growth itself, the structure looked most like an epithelioma, the epithelial lining of the hair-follicles being thickened by new cell-growth, with a less regular arrangement than usual of the cells.

It was hardly possible to say decisively in what part the disease had commenced; but, taking into consideration that the most advanced condition of cell-growth was to be found in some of the hair-follicles, where the tube was literally choked by cells, while the tissues outside were only invaded to a less extent, it seems more probable that, commencing in the hair-follicle itself, the disease had subsequently spread into the adjacent tissues. This would accord, also, with what was observed in the first case. Here, again, though this is not shown in the drawings, it was almost impossible to say, in some sections, whether one was dealing with epithelial cells or with sarcomatous nuclei in their connective reticulum.

A third case is to be found in the 'Transactions of the Pathological Society of London' for 1868. It was exhibited by Mr. Birkett, under whose care it occurred at Guy's, and with his permission I have reinserted it here, as I wish to contrast its microscopical characters with those observed in Mr. Poland's two cases.

A healthy-looking postman, sixty years old, was admitted into Guy's Hospital, in March, 1868, on account of a tumour on his back, which had lately given him inconvenience. The existing growth began as a small lump fourteen years before, and for many years he was almost regardless of its presence.

Attached to the integuments of the back there was a tumour about three inches and a half long, extending nearly parallel with the posterior border of the right scapula, and resting on the fibres of the trapezius muscle. The skin covering its surface was red, and at one extremity curious yellow nodules were to be felt. It was firm and resisted pressure generally, although its outward appearance led to the impression that it was soft. Besides, on the head there were two scalp tumours—one in the left temporal region also showed a hard, yellow body in its substance; a second, on the vertex, was of the ordinary appearance. They had been forming about two years. The dorsal

growth was excised some days before the others. Two or three rather full-sized vessels supplied it with blood; but it was only formed in the integuments, and was perfectly independent of the tissues beneath it.

All the wounds healed rapidly, and the man left the hospital well.

The tumour was referred to the Morbid Growths Committee, and the report was to the effect that the tumour had evidently been situated immediately beneath the skin, a portion of which had been removed with it.

The section was found to consist of two substances—a firm opaque, white, smooth material, collected into masses varying much in size and outline, and connected together by grey semi-translucent fibrous bands.

On microscopical examination, “the projecting part of the tumour is covered by a cutaneous layer of normal structure, the surface of which is papillary, and has been denuded of its epidermis. Beneath the skin is a layer of fibrous tissue arranged in parallel bands.”

The mass of the growth consists of a stroma, which is in some parts faintly granular, in others finely fibrillated, and in others, again, represented by bands of parallel fibres. These bands form a reticulum, the meshes of which are occupied by rounded or oval masses, consisting partly of a finely granular and very translucent interstitial substance, partly of aggregations of cells. These aggregations are, in some parts, rounded or oval, whilst in others they occupy sinuous channels of extremely irregular outline, which, from the sharpness of their margins, look as if they had been hollowed out of the stroma. Each of the opaque-white nodules described above, as seen by the naked eye, consists of a similar arrangement of fibrous and cellular structures, enclosed in a distinct capsule of white fibrous tissue.

“The cells are rounded, oval, or polygonal, contain, for the most part, a simple nucleus, and measure from $\frac{1}{2000}$ to $\frac{1}{2500}$ inch in diameter. In general appearance and character they closely resemble glandular epithelial cells; but in no respect have they any arrangement similar to that seen in normal or pathological gland-formations. Many of the masses of clear interstitial substance are cylindrical, and in these the axes appear to be occupied by refractive granules, the nature of

which could not be determined, although their appearance is very characteristic."

The committee then proceeds to say that the tumour presented such marked peculiarities of structure as to render it difficult to establish its precise position in any classification. It would appear to belong to the class of tumours designated by Virchow as the "fibromas of the skin and subcutaneous tissue," in which are included elephantiasis, molluscum, and papilloma.

A drawing of the gland-like cells with their arrangement, in regard to the fibrous parts of the tumour, is also appended, and published in the volume of 'Transactions' for the year 1868.

A fourth case is that known as Chassaignac's, and was described by that surgeon as one of *Cancroïde du Crâne*. It occurred in an old woman of sixty-eight, who had noticed two small tumours on the scalp at twenty years of age. Sebaceous matter exuded from these when she had attained the age of forty years; but not till sixty did they begin to grow, when, after a blow, bleeding and rapid increase took place. Subsequently smaller tumours came on other parts of the scalp, and she died by ulceration attacking the bone and exposing the brain. No trace of disease existed in any of the neighbouring glands.

The microscopical details of the case have been fully described by M. Rouget, but I have been unable to lay my hands on the paper; Mr. Prescott Hewett, however, giving particulars of the case, states that M. Rouget characterises the growth as "*une tumeur épithéliale présentant une structure toute spéciale*," so that we may infer that this case also was very closely allied to those which have now been narrated.

From the foregoing descriptions it will, I think, be evident that the first three tumours, at any rate, described in this paper were, all of them, growths similar to those described by Mr. Cock, in his communication already alluded to; and believing that they were so, I have not hesitated to apply the term "follicular disease" to the two cases with which I am more especially here concerned. But though similar in their rough general characteristics, both to each other and to the group described by Mr. Cock, it will be equally patent that the microscopical peculiarities of each were somewhat different—one

resembling a gland in its cellular elements more nearly than anything else, a second being of an epithelial character; the third sarcomatous.

It next became a question whether, proceeding upon their microscopical differences, each should be described as a distinct species, or whether they ought not to be regarded as varieties having a common origin, or as different results of a single cause. I have elected to take the latter view, and this not because, in the examination of the cases before us, any decisive indications were observed, one way or the other, for such were not present, but rather upon the more general ground that in this, if not in all tumours, varying *ad infinitum* as they do, analogy forms the most reliable guide to classification.

In accordance with this opinion I shall, therefore, proceed at once to obtain some evidence as to the nature of follicular disease from indirect evidences, of which not the least important is the fact that most of such tumours are associated with more or less numerous sebaceous or atheromatous cysts, either in their own neighbourhood or situated on other parts of the body. It will next be remembered that, given a cavity or space in any part of the body under abnormal conditions, there is a tendency for that space to become obliterated by the growth of cells into it from the surrounding wall; hence the filling up of an abscess cavity by granulation tissue, the stuffing of cysts in the breast or ovary with intra-cystic growths, while in the matter of follicular tumours there seems enough evidence to indicate that in many cases the tumour may have been wholly produced by transformations or development of its epithelial cells into the fibrillated material, which does duty for fibre and holds the mass together. In all these three cases, but especially so in the more typical specimen (Case 1), such an hypothesis seems probable. All were of a less well-developed structure than is usual in most new growths; the fibroid tissue forming the canaliculi was little more than a delicately fibrillated stroma, and in some places it almost seemed possible to say with certainty that it had been formed by the condensation of epithelial cells.

I say that these tumours are less well developed than most new growths. One need not go far for an explanation of this fact if it be, as I believe, a constant one in their history. A granulation tumour, a fibrous tumour, the sarcomata, &c., are

formed from, and therefore on the plan of, tissue which has passed on from the stage of mere cell aggregation to that of perfect structure—from a mere heap of bricks to a finished edifice. Any fresh superstructure should necessarily be in keeping, and so we find it to be. In the same manner the sebaceous secretion is sebaceous in virtue of the very tendency of its cell constituents to pass rapidly into a fatty state, and it would be remarkable if, no matter what its further evolution, this tendency could not in some measure, more or less, still be traced. Accordingly we find, first, that they easily degenerate, and this in a way quite different from the minutely granular fat change which may usually be observed in other degenerating new growths. They become oily and glistening in a manner which is difficult to describe, but which, when once seen, is very characteristic. Secondly, follicular tumours are very frequently associated with cysts, formed, not by any active growth, as in other tumours, but rather as a part of or pertaining to the degeneration which has just now been described; the central parts of tracts of cells become soft and sebaceous, while the circumferential parts more advantageously situated for maintaining their nutrition still continue to exist. Here we have a fact which seems, whatever explanation may be given of its occurrence, to throw some light upon a disputed point in the pathology of sebaceous cysts. It has long been held by some that wens are no more than retention cysts. It is thought by others that they are new formations. Now, if in what is evidently a new growth there still remains a trace of its origin from cells which, in a normal condition, should have formed sebaceous matter, it may well be that all degrees should occur between complex tumour and simple cyst, according as the tumour tendency is energetic or the obstacles to the existence of what is, at best, a lowly organised structure are predominant. Exactly, then, as an encephaloid mass in the liver or elsewhere is found with a wall of tumour and cream-like contents, so is the sebaceous mass with its contained pultaceous matter.

In illustration of this point, that an apparent cyst may be in reality a growth, a case may be mentioned, which I had an opportunity of examining a short time ago by the kindness of my friend Mr. Richard Rendle. An infant had some small molluscous tumours on its face, and what was, to all appear-

ance, a sebaceous cyst over the right eye, at the outer extremity of the brow. It may also be stated that the mother had a well-marked specimen of molluscum contagiosum in the right temporal region. The sebaceous cyst was carefully dissected out, and then hardened in chromic acid. When cut in half its wall was noticed to be rather thick, and on making a section of this wall it at once became evident, by the usual appearances, that what had been a tumour was now a cyst, with all the microscopical characteristics of molluscum contagiosum still remaining.

The other view, and the more mechanical one, as to the production of wens may be stated thus:—that within a follicle some accidental accumulation of the secretion occurs, which gradually fills the follicle, when, by the pressure of the material so retained, the outer layers become fused together and semi-organised, much as a fibrin clot in the cavity of the heart, or of an aneurismal pouch, becomes fused into a fibroid tissue, which, blending with the atrophied muscle or arterial coats, is with difficulty distinguishable from them. This condition is described by Mr. Prescott Hewett as common in sebaceous tumours, when he says,¹ “In many cases it is difficult to define the exact boundaries of the cyst itself, so intimately blended are the cyst and some of its contents.”

But whether this or that theory be accepted as to their probable origin, it must be apparent how very close is the connection between sebaceous cysts and follicular tumours, and therefore between secretion and morbid growth. Possibly, as I have endeavoured to show somewhat more fully elsewhere,² the two latter processes are, to a certain extent, correlated, but as to direct evidence on the point, in this special instance, there is none, since it could not be ascertained whether the primary growth was from the lining membrane of the cyst, though I saw enough to make me think that very likely it was so.

The former view, however, of the two has another very strong ground for its support in the fact, as stated by Sir J. Paget, that “wens are more frequently hereditary than any form of cancer.” Now, it is hard to conceive that a mere retention of secretion can be hereditary or anything, indeed, more than mere accident, while it is very easy of conception, nay,

¹ Loc. cit.

² ‘Edinburgh Medical Journal,’ May, 1872.

very probable, that a tendency to abnormal cell growth may be engrafted on the ovum from the parent. That sebaceous cysts or tumours occurring in connection with the skin are entirely new formations, in the sense that they have no connection at any period of their development with the sebaceous glands or hair follicles, I see no evidence.

One other point of some interest may also be touched upon here, inasmuch as it has a rather wide bearing on many pathological processes. I refer to the view that has been generally held that the horny layer of the epidermis, sebaceous matter, &c., is so far an excretion as to be entirely dead to the body which produced it, and to be no longer a part of that body, but an extraneous substance. These follicular tumours seem rather to point to an opposite conclusion, and tend to show that cells whose proper function is to form sebaceous matter are by no means incapable of further life when shed, but that, under favorable conditions, the most obvious of which is that they shall be retained within the parent follicle or cyst, they may imbibe nutriment sufficient to maintain a low state of existence till, by the projection of vessels into the mass, that existence shall become to a certain extent secured.

The same principle is accepted without hesitation in the case of skin grafting, and it seems perfectly sufficient to explain the contagious principle of molluscum contagiosum or, even still further, the *possible* contagious element in a cell of any tumour. Such a thing, at any rate, is not impossible.

And now for a word on the more general relations of follicular tumours. They have been described by Mr. Cock, in the paper before alluded to, as growths which are of an innocent nature, that is to say, which are non-infiltrating, non-recurrent, and without any of the anatomical characteristics of cancer. In taking this question into consideration, however, I would wish to bring prominently into notice one feature of such cases which is surely very significant, and which, it may be, has been rather overlooked. I refer to the time of life at which the disease occurs. Of the various cases which are recorded of follicular disease, Mr. Cock gives the ages of five patients; they were 65, 40, 45, 72, and 53 years of age respectively. Sir James Paget gives a note of a case in his 'Surgical Pathology' at 80 years. Delpech describes such a disease

(quoted by Prescott Hewett) in a patient of 62. Chassaignac's patient was 68, while Mr. Birkett's patient and the two under Mr. Poland's care were 60, 56, and 60 years of age. Here we have eleven cases, only two of them being under 50. Further, several cases have now been recorded which, while closely simulating fungating follicular disease, have, when removed, proved to be of a malignant nature. Such cases are described by Sir J. Paget in his 'Pathology,' and by Dr. Cruickshank and Mr. Holmes, in the 'Transactions of the Pathological Society.' These, again, were of the ages of 64, 69, and 64 years.

Now what does this question of age mean? That the cases described as innocent have been incorrectly so called? By no means. But if it means anything at all it surely signifies that one cancerous element, that of senile change, was present, and had produced a tumour, with all its subjective phenomena of growth, apparently without limit as to its power of increase, while the phenomena which characterise malignant growths, in their behaviour with surrounding structures, are absent, as well as those of recurrence after removal.

It is the possession by these tumours of *some* of the attributes of cancers that adds much of interest to a question that can hardly be called important by reason of its frequent occurrence. It will be allowed that, no matter what the special interest attaching to a tumour, it falls short of teaching its most useful lesson if it does not help us on, by its relation to other tumours, to truer views of some branch or other of the physiology of decay. Follicular tumours are not wanting in this respect. Through them, and not only through them, but through all other growths only partial in their characteristics, a view is obtained, it may be said, of cancer in the rough, of the *study* for a picture rather than the picture itself—of an unfinished fabric; and it becomes easier by their aid to supply the finer touches which shall exhibit a growth with malignancy depicted in all its completeness.

It has always been distinctly recognised in practice that cancers are, for the most part, an evidence of senile degeneration. Statistics, such as those of Walshe, Sibley, and Marrant Baker, do but confirm this opinion, and show that the liability to attack increases with the age of the individual. In the

cases before us certain sebaceous tumours, in some instances after a long period of quiescent existence and at the declining period of life, begin to increase in an active manner. It may not be that they put on at once all the characters of infecting tumours, yet, inasmuch as at a critical period they become active in their development, that fact alone should cause them to be regarded with suspicion. The daily practice of surgery does but confirm in other regions this relation between the age of the patient and the character of the tumour. The period of life at which the disease occurs is, it seems to me, the one great point which influences surgeons in the diagnosis between innocent and malignant tumours. Take, for example, those of the female breast. If a patient comes under notice, past middle age, with a nodule which has as yet none of the features of an infiltrating growth, yet a surgeon will be very cautious in pronouncing it of an innocent nature. Or, again, an infiltration of the breast is under consideration, unaccompanied by any glandular enlargement, and perhaps with a definite history of injury. Again, he will lean towards cancer in the old patient, while, without doubt, in younger life the question of chronic inflammation would be discussed and a more hopeful prognosis given.

Thus, it will be seen that sebaceous tumours, with their stage of fungating disease, lead up to the old question of a special cancerous diathesis. Let it not be understood that such a wide subject is about to be argued out here; only proceeding from these special cases it will be well to see what suggestions they offer on the more general question.

Now, if it be true that certain individuals may exist for years with an apparently innocent tumour, and suddenly, at a certain period of life, such tumour may begin to grow and, perhaps, to infiltrate neighbouring structures, it is difficult to explain in such instances the diathesis of later life apart from that of its earlier stages. If ultimately a cancer why not always a cancer, supposing a special tendency to that disease to exist, and yet the earlier stages of these growths could not be designated as such. The proposition, then, which such cases seem to suggest is this, that the tendency to infiltrating and recurrent growths is dependent rather upon the element of age than upon a particular constitutional taint. This is not to say that cancer, using the

term merely as implying certain habits of life on the part of certain tumours is a local disease, but that the hereditary element is a predisposition to abnormal growth in general, and not to special cancer growth.

We are now quite familiar with the fact, ascertained by workers in comparative anatomy, that variations in any direction are liable to be transmitted from parent to offspring, and so to run in direct lines of stock. I see no reason why this law should not be applied to the question under consideration. It was to be expected that this tendency to variation should show itself sometimes in excess as a pathological condition, and so it does. Thus, we meet with cases of exostosis which are regularly transmitted, and the same thing surely may occur with other forms of tumour. But, from the same point of view, it seems highly improbable that cancer, as cancer, should be transmitted; first, because transmission comes most into play in the perpetuation of slight variations or those very closely related to normal conditions. Now cancer, far from being a slight aberration, is a very divergent condition of cell life. Secondly, it is a state which generally appears after sexual life has ceased in great measure. And thirdly, from a purely Darwinian aspect, the diathesis would supply its own corrective, in that, being a condition most unfavorable to those affected by it, the cancerous lines ought to become soon exterminated. It seems on the whole, therefore, that there may be a general tendency to the transmission of variability to the component cells of the body, more particularly in the direction of excess of normal structure. If this condition were constant in any particular organ or tissue, then tumour might, I apprehend, be produced by this tendency to variation, but only if fixed and increased through several generations. But these conditions of variability would not appear to be so sufficiently constant in any one part as to ensure the transmission of tumours, except, perhaps, in exceptional instances. It is, therefore, more probable from this point of view, that local conditions play a large part in determining the excessive growth which tumours represent.

Allowing, then, the transmission of tendency to variation, some families will show this much more conspicuously than others, in that the taint will be stronger in some than in others. These would be the subjects of new growths. The nature of

the tumour *ought*, then, to vary as the time of life, and we may assume that in some persons would appear such excrescences as a crop of warts on the hands or elsewhere, in others, a gland tumour in the breast or a molluscum, or, may be, a cancer or fungating follicular tumour. The progress of the tumour will, I say, be mostly determined by the time of life at which the subject of it has arrived. Cancer being an evidence of senility will be found towards old age, while homologous tumours will appear during the formative stages of existence.

It may be said that a large number of cancerous growths are prone to appear in young life, and by no means necessarily in old people, and this is granted, and indeed is acknowledged as likely. For, in the first place, much as a child may get atheroma of its arteries, or, perhaps, cirrhosis of its liver or kidneys, certain young people may show their early decay by running off into a cancerous state. These, I suspect, are cases of rarity; but there is another explanation of the tumours of young life in the conditions of tumour growth itself:—new growths, or a single cell of the multitudes which compose these compound structures, are acting or growing in obedience to two forces which should act harmoniously together; there is one force acting on the cell itself, by which it lives *per se*. There is another or formative force, by which that cell is moulded to the requirements and the likeness of the parent body. It requires no high flight of imagination to conceive that this balance of force may be destroyed, that the moulding force may be deficient, or (what comes to the same thing, and is, perhaps, more likely in young life), the growing force be in excess, and we have the requisite conditions for the production of a growth which can increase of itself without any attention to surrounding tissue. The condition in advanced life is the same, except that in this case the nutritional force being more nearly constant, the moulding force may be said to be ceasing, if not extinct, and thus again tumour is brought about. Having got thus far, there is another condition which completes the history of the growth and explains its infiltrations, viz. the influence produced on healthy cells by their neighbours in a state of morbid activity. This I shall not enter upon here. The condition is very evident to all observers of tumours, and is very generally recognised. In true hypertrophic tumours the two forces

described may still be supposed to work together, though probably both are somewhat in excess.

This relation between innocent and malignant tumours might, I think, be proved to exist in every tissue in the body; but it is most markedly so in those organs which are the more active, such as the glands. Thus, as has been said, a young woman gets an adenocoele in the breast—an older one a scirrhus cancer. The tumours connected with the skin, glands, and follicles are no exception to the rule. They have their growths of young and old life precisely analogous to those of the breast, and in young people we meet with molluscum contagiosum, or a sebaceous cyst; in an old man we meet, sometimes with cancer, and if not with that, then with the disease which I venture to think is an elementary form or early stage of cancer, viz. fungating follicular tumour. It may not, it is true, be a perfect form of cancer; but then the clinical features, viz. infiltration and recurrence, are apparently dependent upon conditions such as duration, and probably to some extent upon local causes.

Summary.—There seems to be enough evidence to show, first, that follicular tumours are, in their bare anatomical details, suspicious in their tendencies, and that, inasmuch as their anatomy is an index, rough though it may be, of their life's process, that is to say, of their pathology, from the latter point of view they may still be said to have very close relations to the cancerous or malignant group.

Secondly. Abundant material is at hand to prove, as former writers on the subject have shown, that, clinically, such tumours have not the behaviour of cancers, and if removed they do not return. Pathology and surgery in its clinical aspect would seem at first sight, then, to come into collision; they do not do so in reality. The non-recurrence of the tumour only shows that the regions more especially prone to attack afford opportunities for their complete extirpation, or that allowing of growth which is malignant in its nature, the local peculiarities of the part have been in some way inimical to the extension of the disease.

It seems almost unnecessary to add that the practice urged by Mr. Cock, in his paper on the subject, as to the advisability of the early removal of the tumour, is very strongly supported by these observations.

DESCRIPTION OF THE PLATE

Illustrating Mr. Goodhart's paper on Follicular Disease of the Scalp.

Fig.

- 1.—Oblique section of scalp at base of follicular tumour (case 1).
 - a. Section of hair in its follicle.
 - b, b. Loculi having somewhat of a glandular arrangement, filled with squamous epithelium.
 - c, c. The epithelium has here escaped from its bed, leaving a delicate connecting stroma, such as is seen in many sarcomata after pencilling.
 - d, d. Corium of scalp. 1 inch object. Camera. Chromic acid prep.
- 2 & 3.—Showing the arrangement of the epithelium round a small cyst.
 - a, a. Lining membrane of cyst having a fibrous appearance.
 - b. Squamous epithelium. Fig. 2, 1 inch. Fig. 3, $\frac{1}{2}$ inch object. Camera.
- 4.—Section of follicular tumour (case 2, 1st operation). From the base of the tumour. Section vertical. It shows the usual appearances of a variety of round-cell sarcoma. All the sections wherever taken had much the same appearance. $\frac{1}{2}$ inch object. Camera.
- 5.—Section of recurrent follicular tumour, near its junction with the scalp.
 - a, a. Connective tissue forming loculi.
 - b. Sarcoma tissue between the loculi.
 - c, c. Rapidly growing sarcoma, the connective tissue replaced by a rather granular matrix in which the cells lie embedded, a very similar condition to that known as the more common form of myeloid sarcoma. $\frac{1}{2}$ inch object. Camera.
- 6.—Oblique section of scalp adjacent to the recurrent growth, showing a hair follicle and neighbouring corium structure.
 - a. Pigmentary fibrous part of hair. The medullary part was absent or not seen.
 - b. Outer layer of hair which had a very dimly imbricated appearance (root sheath).
 - c. Epithelial lining of follicle in an early stage of cell proliferation. All stages were seen between this and one in which the hair was represented by a granular brown pigment, and the epithelial cells by closely-packed nuclei.
 - d, d. Corium with nuclei in its meshes.
 - e, e. Ducts (of sweat glands?) whose epithelium is undergoing the same growth as the parts around.

Fig. 1.

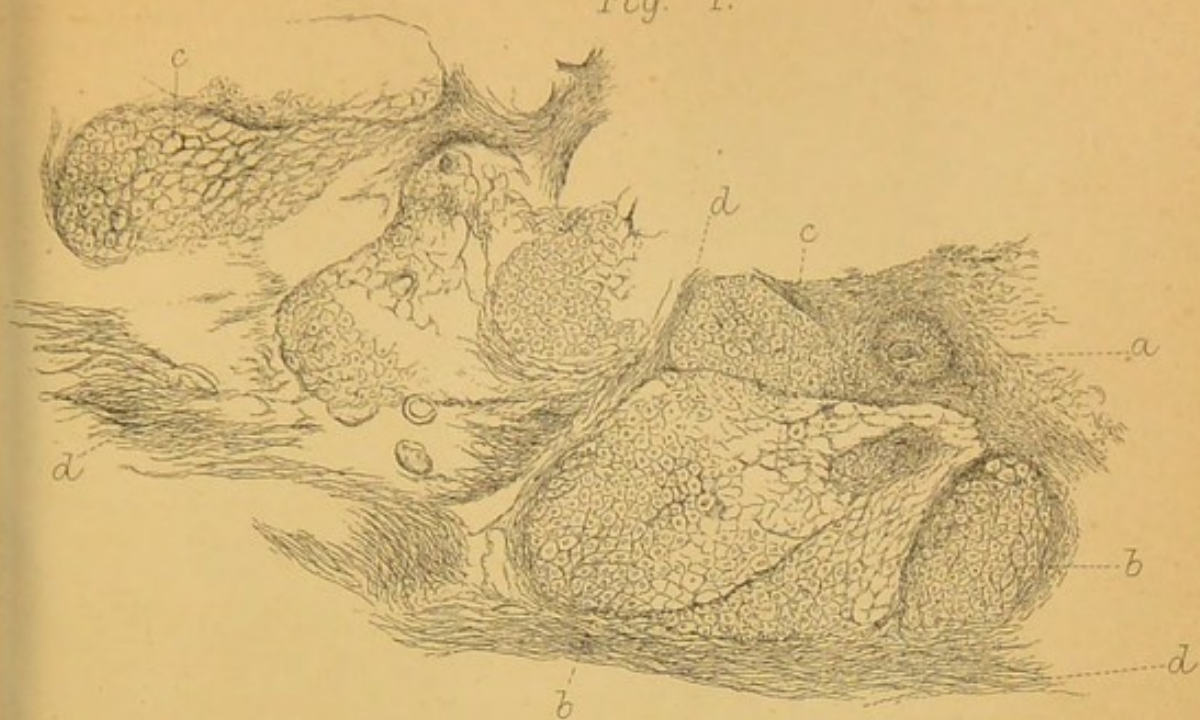


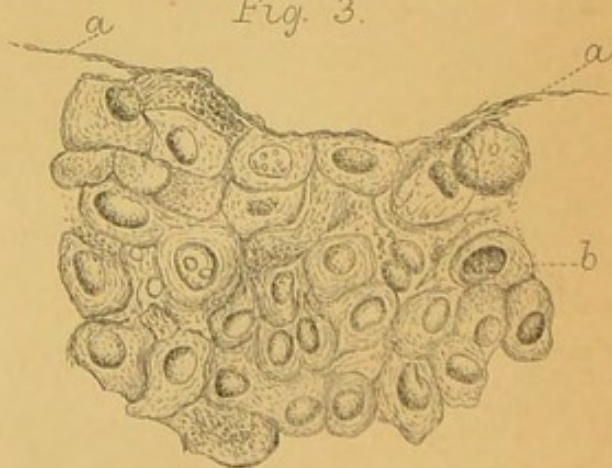
Fig. 2.



Fig. 4.



Fig. 3.



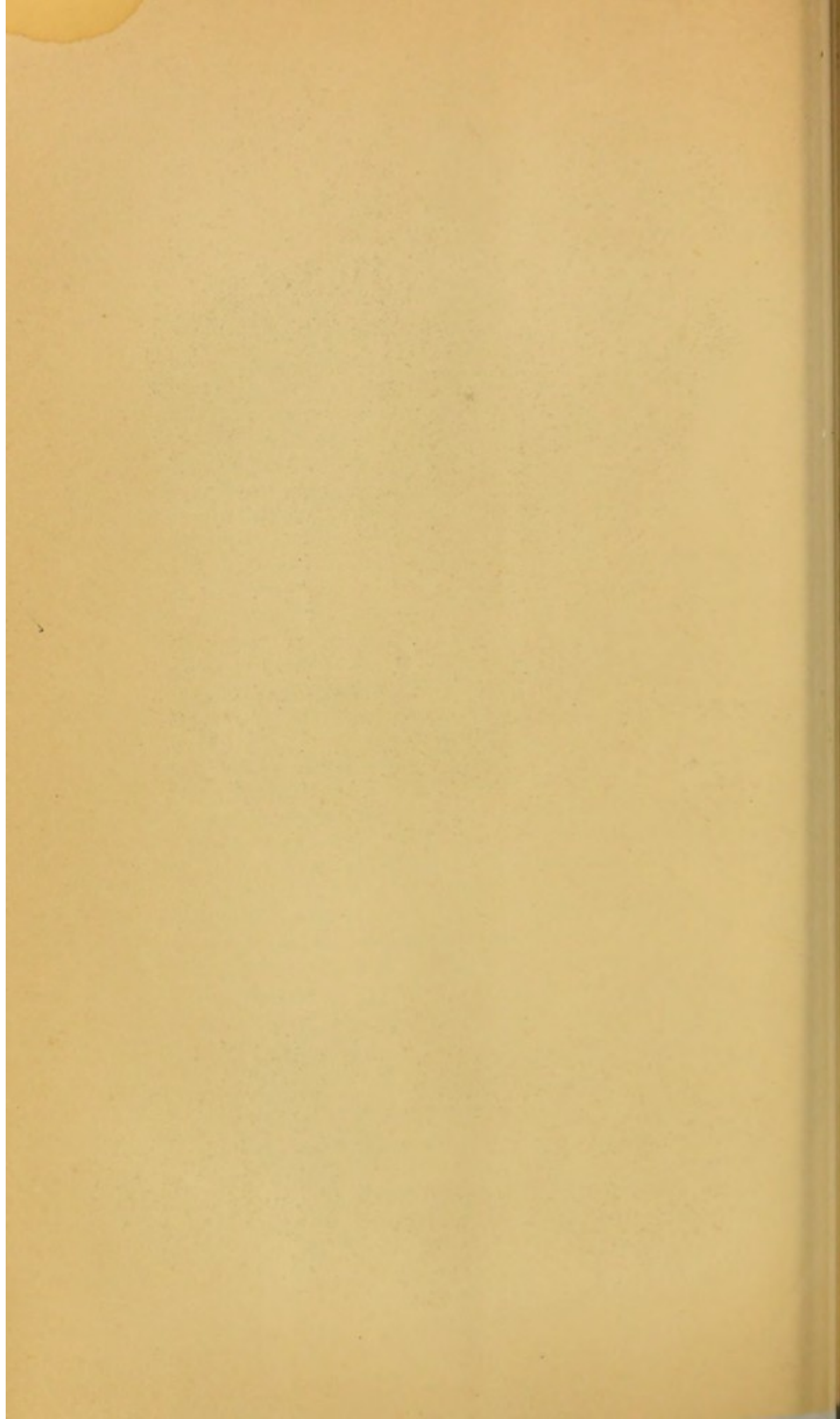


Fig. 6.



Fig. 5.

