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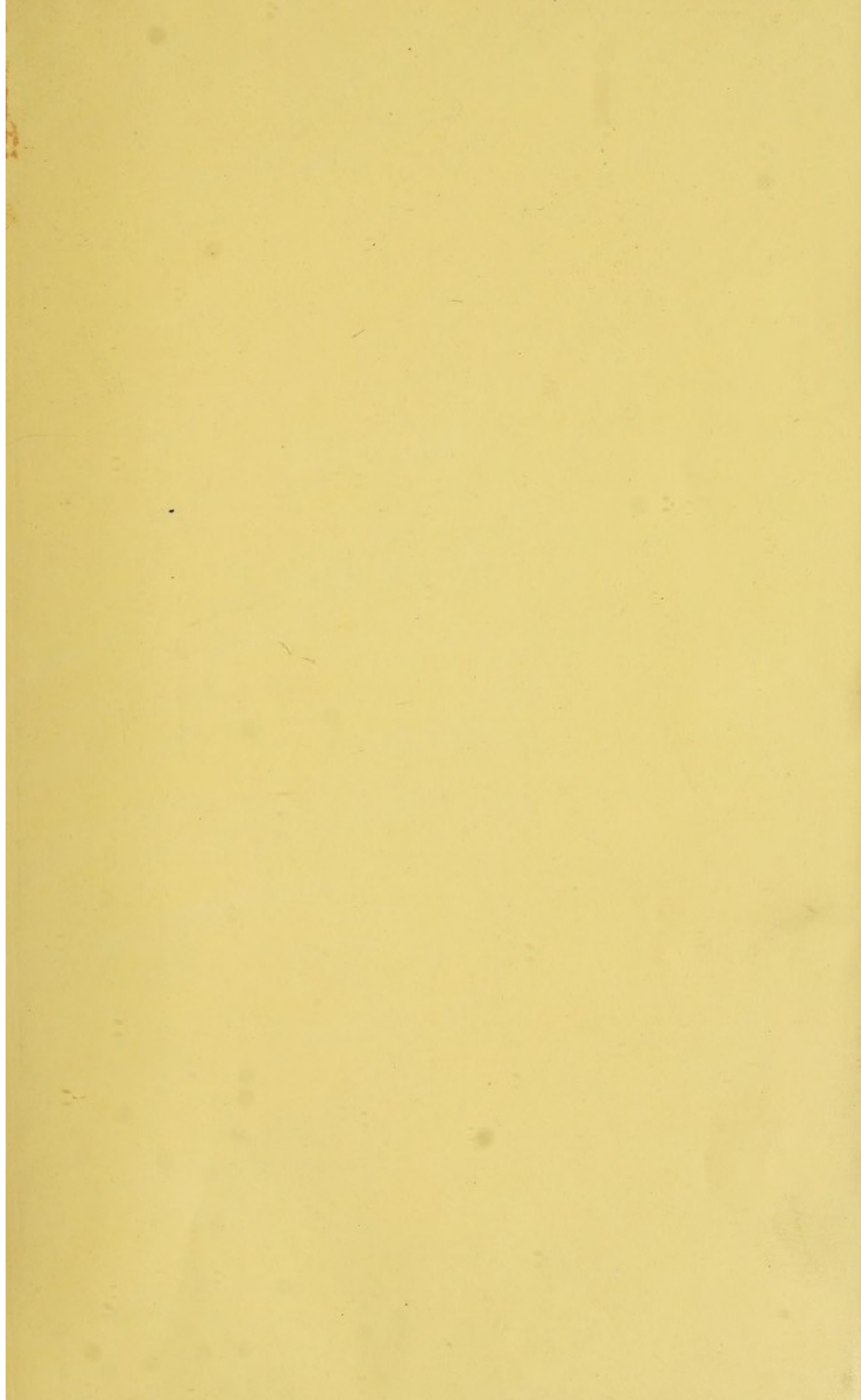
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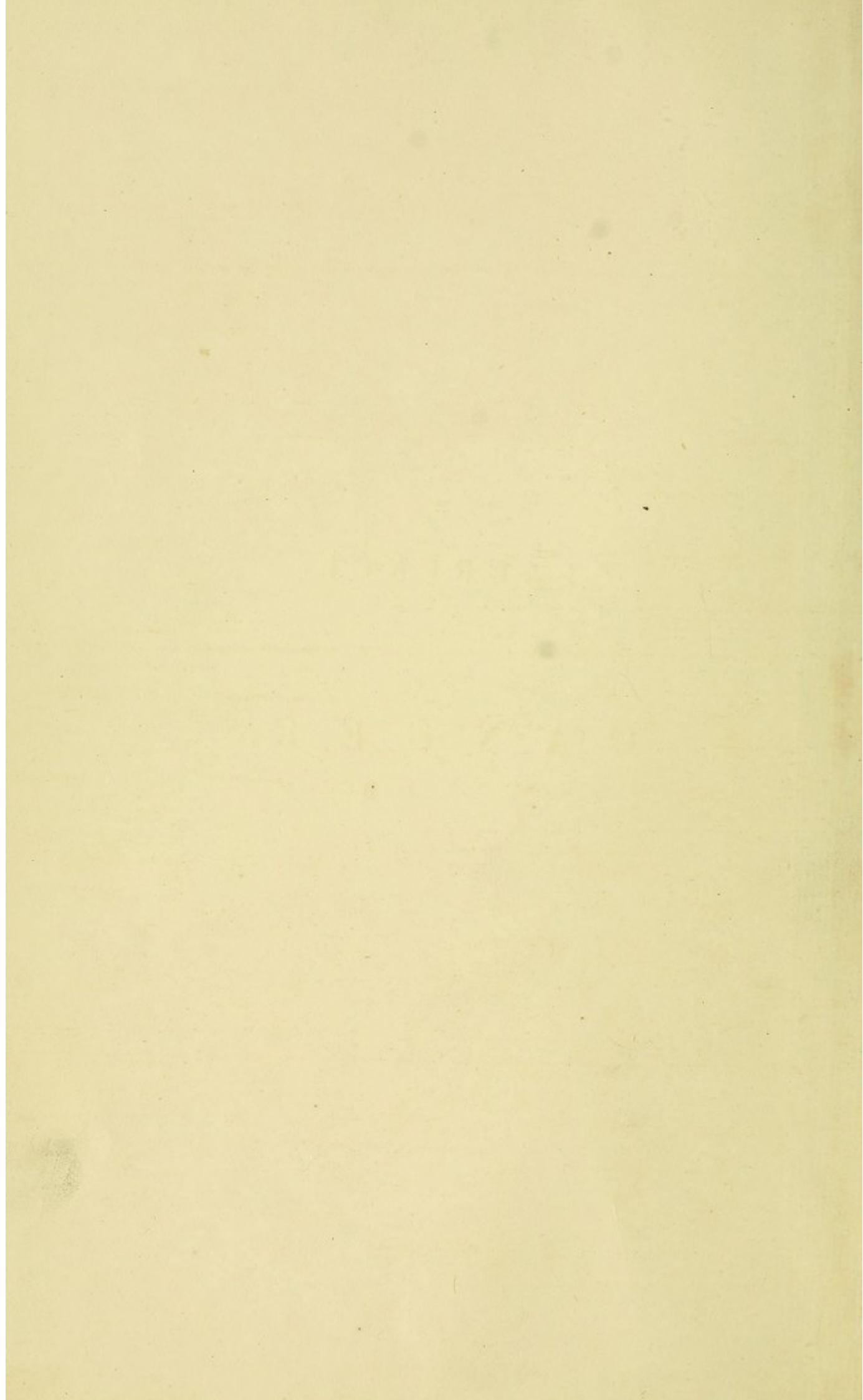
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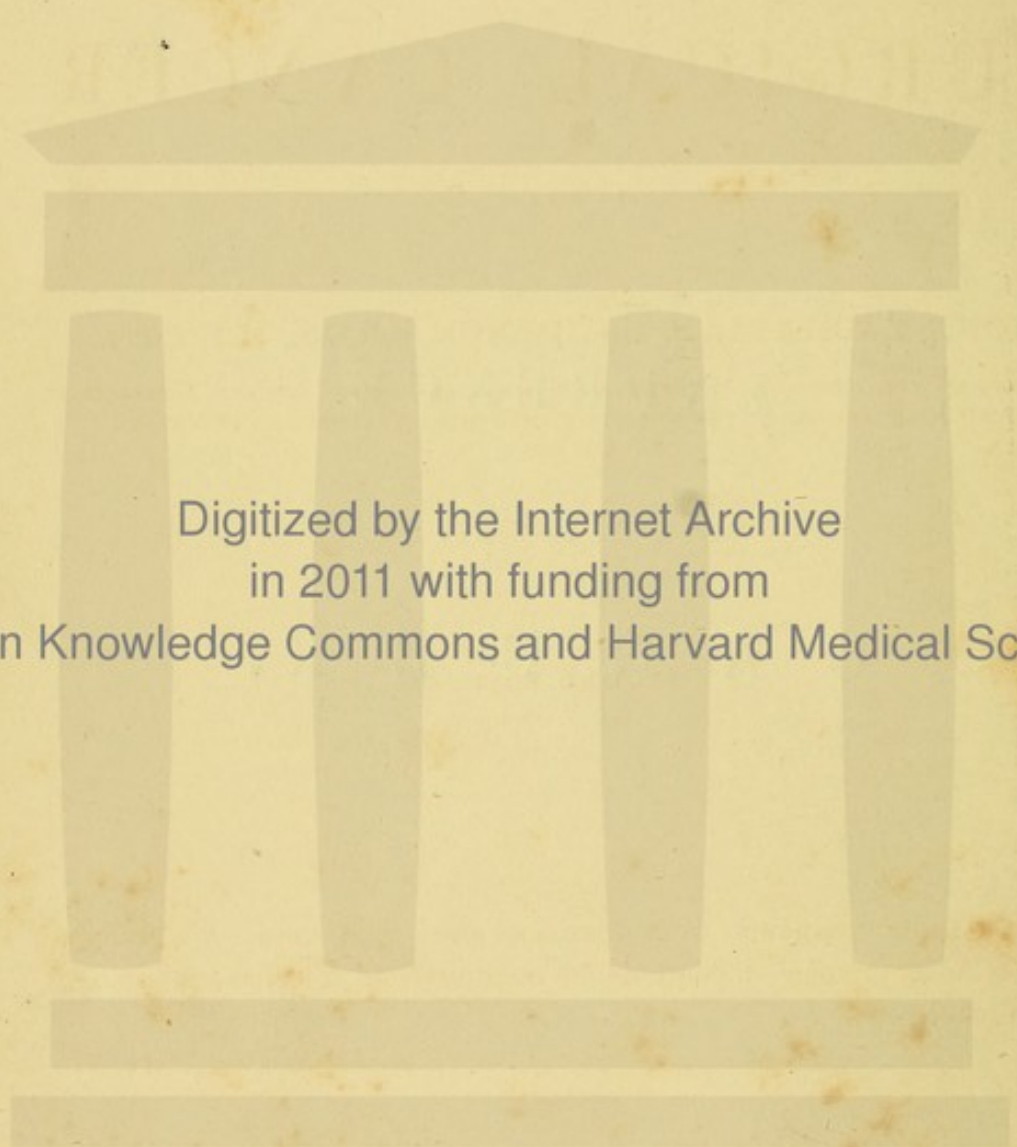




LAURENCE

ON

CANCER.



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THE
DIAGNOSIS
OF
SURGICAL CANCER

BY
JOHN ZACHARIAH LAURENCE, F.R.C.S., M.B. LOND.,
SURGEON TO THE SOUTH-LONDON OPHTHALMIC HOSPITAL—MEMBER OF THE PATHOLOGICAL
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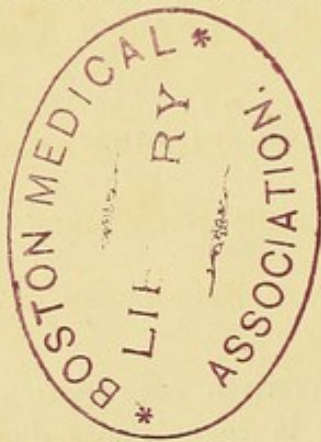
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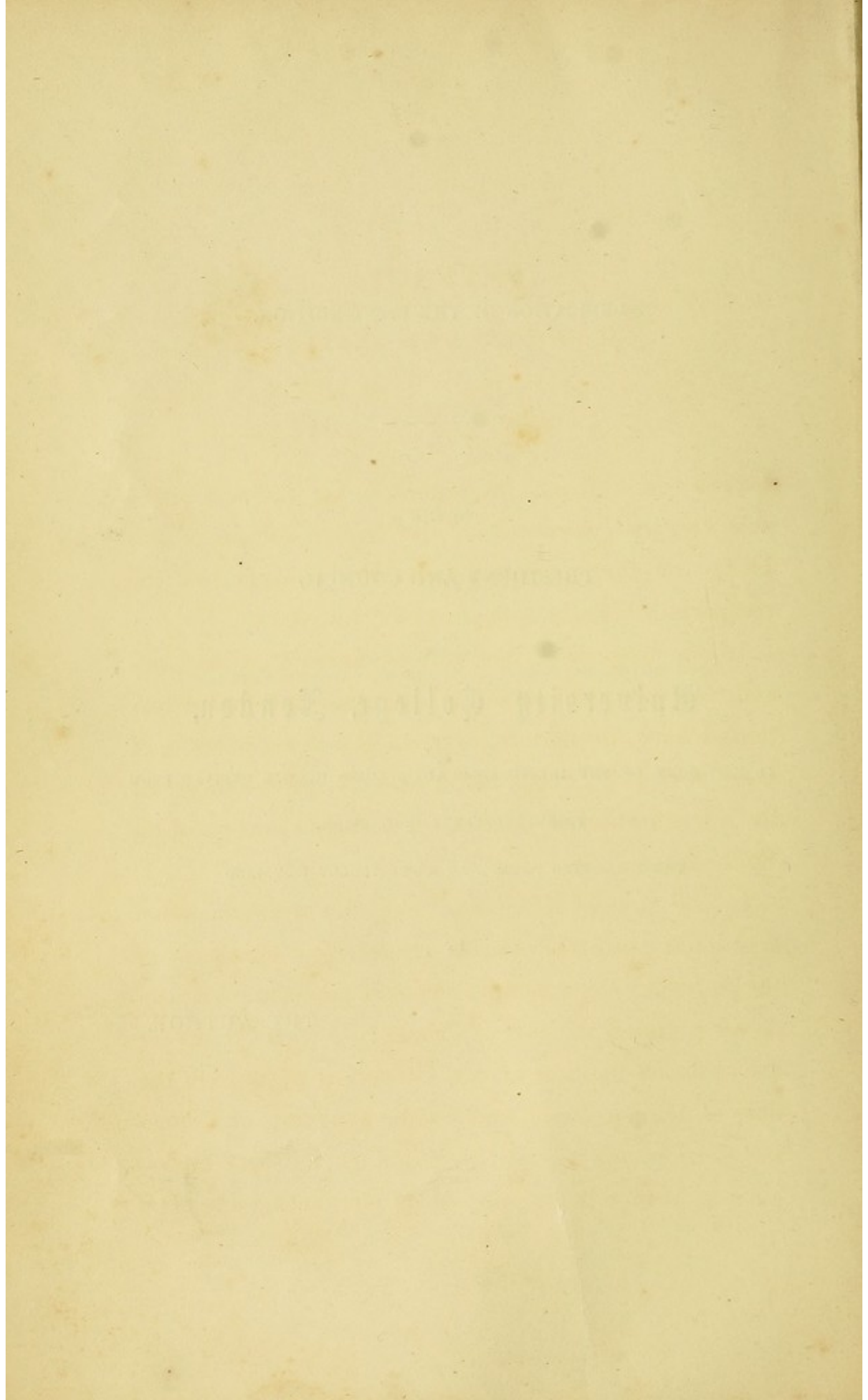
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PREFACE

TO THE SECOND EDITION.

I HAVE first to thank the profession for the very favorable reception accorded to the former edition of this Essay: on that reception rests the apology for the comparatively early appearance of this edition.

In the present edition will be found 1°, a multiplication of observed facts; 2°, the more matured reflections I have brought to bear on the interpretation of these facts: 3°, three additional Chapters—those on the Classification of Cancer, on Colloid Cancer and on Epithelioma.

In the present utilitarian age the question often arises, what *practical* benefit ensues from the study of the pathology of an incurable disease; how much nearer do we approach the *cure* of Cancer? I regret to say we are as far off the cure of *real* Cancer, as we were in the days of Hippocrates. And yet the Diagnosis of Cancer is not so barren a study, as might at the first glance appear: if thereby we succeed in eliminating any class

of tumors from the fatal category in which they had hitherto been enshrouded, and hence by an early operation save the patient from a miserable death, a real and substantial advance has been made in the treatment of tumors. This remark applies more especially to Epithelioma, the benign nature of which, predicated by Lebert, Bennet, and Hannover from its anatomical structure, I have endeavoured to confirm by reference to its clinical history.

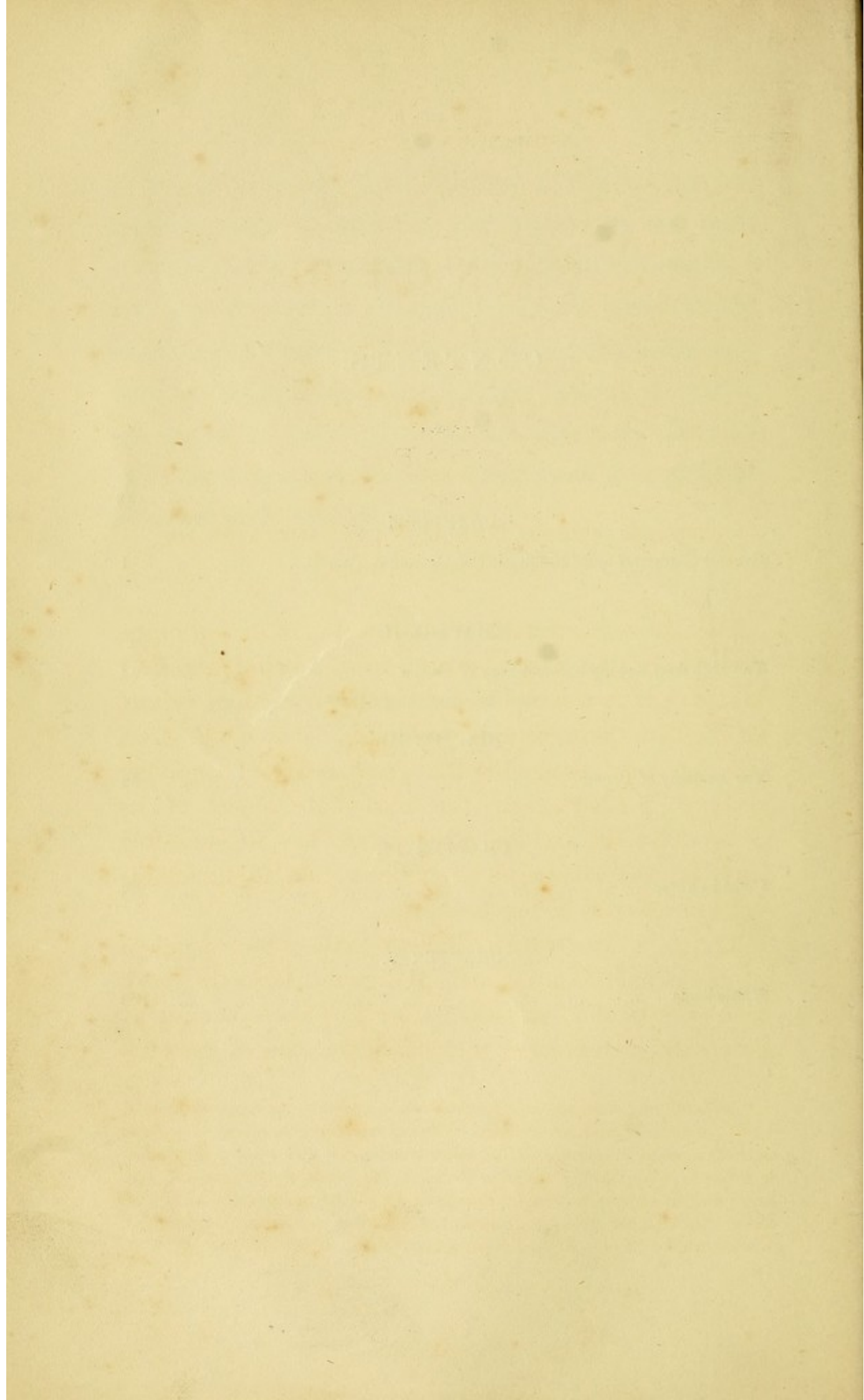
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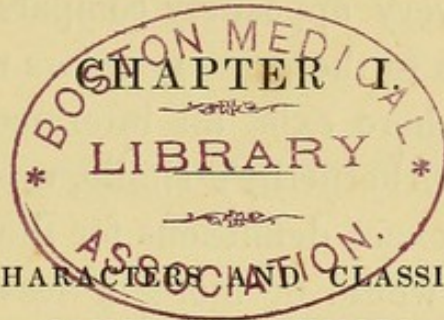
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C A N C E R.



GENERAL CHARACTERS AND CLASSIFICATION OF CANCEROUS TUMORS.

CANCER, or carcinoma, is a name of extreme antiquity, derived, in the first instance, from fanciful similes.* MALIGNANT is a term of comparatively modern origin. Of the two, the former is preferable. For while it, on the one hand, possesses the great merit of implying nothing further than the immediate object of its designation, it, on the other hand, has so engrafted itself on the languages of nations, that to ignore its existence would be but pedantry.

The definitions which different authors have imposed on the words Cancer and Malignant Growths have been of a twofold nature: either they have, aiming at simplicity, endeavoured to identify the class of growths

* The distended subcutaneous veins have been compared to the claws of a crab, of which the tumor represented the body. "Tumor evadit magnus et cum *venis circa circumtumentibus et liventibus instar pedum cancrinorum* unde etiam nomen habet, se prodit." (Ettmüller, *De Morbis Virorum, Mulierum et Infantum*, cap. 10.) Ambroise Paré seeks to impress the name by an actual drawing of a crab. "D'autres auteurs ont expliqué ce nom par rapport à la douleur rongeante que cause cet horrible mal." (*Traité du Cancer*, par Alliot. Paris: 1698.)

in question with one single attribute,* or they have, with perhaps less regard to analogy with the exact sciences, but with more to that of truth, applied these names to a class of adventitious products, possessing an assemblage of attributes in a greater or a less degree. Abernethy has very appositely compared the different species of tumors to the primary colors of the spectrum, between which there exist all intermediate phases; so that, to pursue Abernethy's simile, even supposing we had arrived at exact definitions for the primary colors, those definitions would be more or less inapplicable to the transitional tints.

The following characters constitute the main features of cancerous growths:—

1. Their deteriorating influence on the general health is often independent of any local cause at all adequate to account for such effect.

2. Their vegetative property: the reproduction of growths similar to themselves in different textures of the organism.†

3. Their frequent liability to local recurrence after the most complete surgical operations.

4. Their indiscriminate involvement of all the tissues, healthy or morbid, they meet with in their progressive growth.

Of these four features the first two are especially distinctive.

* To this class belong Lebert and his followers.

† This second character, it may be noted, includes in its terms the almost universal tendency exhibited by cancerous growths to infect the adjacent lymphatic glands.

Designating, then, by the terms *Malignant Growths*, or *Cancer*, those growths which constantly possess, in a greater or less degree, the *clinical* attributes enumerated above, we may again subdivide them into so many species, according to their *anatomical* peculiarities.* Proceeding on this principle, we have the following classification:—

Genus: MALIGNANT GROWTHS.—CANCER (*Auctoris*).

Species.

- | | | |
|-------------------------------------|---|--------------------------------|
| 1. Scirrhus | } | Cancer, <i>vulgo sic dict.</i> |
| 2. Encephaloid | | |
| 3. Melanotic Cancer. | | |
| 4. Villous Cancer (?) (Rokitansky). | | |
| 5. Osteoid Cancer (Müller, Paget). | | |
| 6. Colloid Cancer. | | |

The following explanatory commentaries on these several species of cancer may not be misplaced:—

(1) SCIRRHUS and (2) ENCEPHALOID constitute the great mass of cancerous tumors, of which they are the generally accepted representatives.

(3) MELANOTIC CANCER has been admitted as a distinct species rather from its clinical relations, than from its anatomical structure. That in this latter particular it is nothing more than encephaloid impregnated with pigment, is easily demonstrable; but the special ages and localities it affects, and its high degree of vegetative faculty, entitle it to a distinct specific position.

* The anatomical characters of the 3rd, 4th and 5th species are illustrated by the *cases* adduced: those of scirrhus, encephaloid and colloid will be spoken of further on.

The following cases afford good illustrations of the disease:—

CASE 1.—*Melanotic Cancer of the Eye-ball: Operation: Death with Consecutive Deposits on the Brain, in the Lungs, Liver and Mesenteric Glands.*

Charles L. was aged 53 years when he was admitted into University College Hospital, under Mr. Erichsen, for a tumor of the left eye-ball. Some eight or nine years before his admission into the hospital he received a blow above the left eyebrow from an iron rod; he did not experience any great pain in the eye, but the sight of it gradually dwindled away, till at last it was entirely gone. Seven years afterwards he was under Mr. Moore at the Middlesex Hospital for what is entered in that gentleman's case-book as "inflammation in an eye destroyed seven years ago by traumatic inflammation; eye large, and full of green lymph." The eye continued red, and occasionally painful, for a year after, and about this time (eleven to twelve months ago) he first began to notice it swelling.

He had lost a good deal of flesh, but otherwise his health had been pretty good. The tumor had never bled, excepting slightly in removing the dressings.

The following notes were taken a week before he was operated on:—

Local Appearances:—Projecting from between, and displacing the eye-lids, is a tumor, reaching from the outer canthus to nearly the side of the nose; its greatest measurements are, from above downwards, one inch and a quarter; from side to side, two inches. The surface of the tumor is smooth; its colour dingy light purplish-red; its feel hard, with a certain degree of elasticity, though retaining, at some spots, the impression of the fingers. The cornea is shrunken, and externally angular in outline; the pupil is filled with an opaque, whitish-buff substance, and its form distorted. The eyelids are not hypertrophied; the lower one bulges inferiorly, is pale and œdematous; the upper one is but little altered in appearance. There is a thin discharge from the tumor, never, as far as he has observed, of an offensive character. He has not suffered any pain in the eye for some time now; when he did, it was of the most acute description, and

was felt principally in the supraorbital and occipital regions. He states he can still distinguish light from darkness with the eye.

General Appearance of the Patient:—He is tall and excessively wasted. His features are pinched, his cheeks sunken, his face partaking, in fact, in the general emaciation of the body. His complexion is remarkably dingy and icteric, his hair black, his right eye dark. He is a very intelligent man, and gives a straightforward account of his malady.

His parents died at an advanced age. His mother's sister had some tumor of the breast, of which he thinks she died. His own health had always been good; he never exhibited any phthisical or rheumatic tendency.

Mr. Erichsen removed the tumor by the ordinary method; in order, however, to ensure its complete destruction, after he had dissected out all that could be felt or seen of the growth, he applied the actual cautery to the entire surface of the orbital cavity—a proceeding calculated also to arrest any hæmorrhage that might ensue.

In order to present the reader with the whole of the anatomical features of this case at once, I shall defer noticing the characters of the growth, till I have briefly related the further progress of the case.

All went on well till a fortnight after the operation, when he began to be troubled with transient shooting pains in the orbit, and eleven days afterwards an irritative form of diarrhœa set in; however, it was not till about six weeks after the operation that any symptoms occurred calculated to create much apprehension. He was then seized with an epileptiform fit; and when I saw him on the following day, he returned no answer to me, when I spoke to him, although he kept his eye fixed on me, following me, when I was leaving the ward, as if he knew me; yet I do not think he possessed much remaining consciousness. He moved all his limbs well. The pupil was moderate in size, and acted pretty well. His tongue was thickly coated with a moist white fur; his pulse was 140 (his average pulse was 80 before). His general condition reminded me altogether a good deal of what I had observed in several cases of traumatic affections of the brain under the name of "cerebral irritation." When I saw him two days afterwards he was dying. His face and body generally were covered with a profuse sweat; he was in a state of extreme exhaustion, yet, to all

appearances, conscious. His pulse was about 160, very unequal and fluttering; his respirations 48; his tongue dry, rough and brown; his pupil of medium size, acting well. He died the following day.

ANATOMY OF THE ORIGINAL TUMOR:—The tumor was, at the first glance, seen to be melanotic cancer of the eye-ball. The special relations of the melanotic deposit were well exhibited by a section through the middle of the tumor, carried from behind forwards through the mass of the growth and the remains of the shrunken eye-ball. The ocular conjunctiva was greatly expanded, and, at the same time, thickened; the sclerotic coat was comparatively unaltered, although shrunken and wrinkled. Between these two tunics lay the chief mass of the tumor. This consisted of a layer of firm, lobulated tissue, of a deep bistre colour, which adhered but loosely to the inner surface of the conjunctiva, but very intimately and firmly to the subjacent aspect of the sclerotic. The average thickness of the mass was one inch and a half. Beneath the sclerotic were the remains of the choroid, of a browner hue than natural; beneath this was a lenticular mass of melanosis. All that remained of the lens was a tough indurated mass of buff-coloured lymph (?). After prolonged search, no remains of the optic nerve could be detected. The sclerotic did not appear to have given way at any point.

Minute Anatomy of the Growth:—The subconjunctival (great) mass of the tumor required to be acted on by chlorine water, before its elements could be well discriminated. It was then found to consist of cancer-cells (Pl. I., fig. 4), intervening granular matter, numbers of fine fat globules, and still unbleached pigmentary masses. The intraocular mass differed from the above in containing no cancer-cells. Some of the muscular fibres of the external rectus, which were examined, were seen to have lost all traces of striæ, but had a uniform nebulous appearance.

POST-MORTEM EXAMINATION. *Head:*—On opening the cranium, about two ounces of slightly bloody serum were found in the arachnoid cavity; the arachnoid was thickened here and there by old lymph. The pia mater was somewhat hypervascular. On the upper surface of the cerebrum was a small melanotic mass, which encroached slightly on the brain-substance. No evidence of disease was found in the brain. The optic nerve of the affected side differed from that of

the sound side, in being smaller and more transparent. No melanotic extension had occurred from the orbit, nor was any consecutive deposition found in this cavity itself. *Lungs*:—The *right* lung was consolidated and hepatised nearly throughout its substance, the character of the hepatisation being intermediate between that of the red and grey varieties, but approaching closer to the latter. Here and there a melanotic tumor was found in the interior of the lung, but a greater number were found at the surface, projecting from this in the form of disks. The average size of these growths was about that of a filbert. The lung-substance immediately around one of the deeper tumors was found not further advanced in hepatisation than that at a considerable distance from it, and that around one of the superficial tumors was found little more than highly congested. I was able to trace distinctly the pleural membrane over one of the projecting nodules of melanosis; it exhibited no extra vascularity. The *left* lung was at parts much congested, but not consolidated. Scattered through its substance were some melanotic tumors, but very few were apparent on the surface. *Liver*:—In this organ were several large masses of melanosis, their average size being that of a very large walnut. Some were of a deep Indian-ink colour and soft; others harder, lighter in tint and showing a somewhat radiated structure. The former were so densely impregnated with pigment granules, that nothing else could be defined with the microscope; in the latter, cancer-cells and nuclei were observed. The hepatic cells of the adjacent liver-substance were considerably filled with bright fat globules. Many of the *mesenteric glands* were much enlarged by melanotic degeneration. The *kidneys* and *spleen* appeared sound.

CASE 2.—*Melanotic Cancer of the Eye-ball: Operation: Patient known to be well two years and four months after the operation.*

Elizabeth K. first came under my care at the Northern Dispensary on August 13th, 1855.

It was then eight years ago that, on getting up one morning, she observed her sight was dim, and found, by closing the left eye, that the sight of the right eye was completely gone. She experienced no pain; the eye was not red, nor did she perceive anything in the

“black” (pupil). About four years subsequently, she was attacked with excruciating pain in the eye, when something “gave way” in the organ; blood and matter exuded. She felt at once relieved. She never experienced any feeling in the eye-ball that led her to suspect the formation of any tumor. This made its appearance about three years since—five years, consequently, from her first amaurotic seizure, and had been gradually increasing. The right eye-lid was reddened, protruded, and was rather œdematous. On raising it up, a tumor of the eye-ball was disclosed, presenting the following characters:—It appeared about the size of an almond (its long diameter across was 1 in.), somewhat lobulated, of a deep slate, towards its outer part nearly black, color, and was covered by a thin membrane, beneath which some distended veins ran. No traces of the cornea, iris, or pupil were left. The small part of the conjunctiva, apart from the growth, was injected and œdematous. What appeared to me an important practical point was that *the tumor moved freely with the eye-ball*, showing it to have no direct connection with the orbital cavity, and therefore more susceptible of complete removal by an operation.

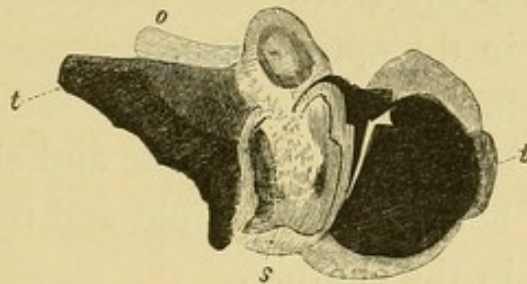
She had at times suffered a good deal of pain in the eyebrow, which had been relieved by leeches; and was now and then troubled with frontal headache. The growth had never bled. None of her family ever had tumors or cancer, or were consumptive. She herself had, independently of rheumatic pains, always enjoyed excellent health, but had got thin within these last years from having borne children so fast. She had had six births and two miscarriages. Her catamenia were regular, and occurred also during suckling. She was a spare woman, of average stature, with light brown eyes and hair, some color in her face, and very intelligent. After watching the progress of the tumor for some time, I at length determined to remove it.

Operation, January 7, 1856.—The patient having been anæsthetised with chloroform by my friend Dr. Hillier, I, with the assistance of Messrs. Quain and Bishop, proceeded to remove the contents of the orbit. A ligature was passed through the anterior part of the tumor, which was then removed in two parts, in the ordinary method, by a scalpel. In the operation it was found that the portion of the tumor apparent to the eye before operating was not more than one-third

of the whole growth, which extended deeply to the very bottom of the socket. The lachrymal gland was likewise removed. The hæmorrhage was very considerable, especially from a rather large artery at the outer angle of the wound; but was effectually arrested by firm plugging and a compress.

Anatomy of the tumor.—It measured about 2 inches from before backwards, and about 1 inch in thickness; it weighed about $5\frac{1}{2}$

Longitudinal Section of anterior half of the Tumor.



o. Optic Nerve.

s. Shrunken sclerotic.

t. The tumor.

drachms. It was inclosed in a thin capsule (the attenuated conjunctiva), and was lobed on its surface. A section was of a color varying from bistre to black, with some spots, however, of a pearly-white translucent hue. Microscopic examination of one of these latter showed it to be studded over (composed of?) cancer nuclei, some of which were inclosed in a cell wall; granular and fusiform cells were also observed.

As regards the relation of the tumor to the structures of the eye, this is best seen in the drawing.

The case went on remarkably well; the patient was up within a week of the operation. There has been, up to the publication of these pages—two years and four months from the date of the operation—no return of the disease. The cavity of the orbit is lined with a pale pseudo-mucous membrane, which secretes a thin mucous (?) discharge.

In a third case of melanotic cancer of the left eyeball, that has fallen under my notice, the liver was so

enlarged by melanotic deposits, as to weigh 15 lbs. 5 oz.; the kidneys, mesenteric glands, sub-peritoneal, pleural, -endo- and -peri-cardial cellular tissues, the lungs and uterus, were also the seats of consecutive growths.

The original seat of melanotic cancer of the eyeball was, in twenty-three cases collected by Lebert, in:

- 7 cases in the orbit.
- 5 „ in the optic nerve.
- 4 „ in the conjunctiva.
- 5 „ between the sclerotic and choroid.
- 1 case between the choroid and retina.
- 1 „ in the choroid.
- 1 „ in the sclerotic.

One of the most remarkable facts in the pathology of melanotic cancer (illustrating a dogma I have advanced elsewhere,) is the extraordinary tendency the *liver* has to become the seat of consecutive deposits in this disease. In fifteen cases which I have collected, in only one single case did the liver escape contamination.

That the proximity of the pigmentary structures of the eye has little or nothing to do with the production of melanotic cancer of that organ, we may infer from its extreme rarity in children, and from the facts that the disease most commonly originates outside the eye-ball, and that it often occurs in other parts of the body.

(4.) VILLOUS CANCER (?) (Rokitansky.) Two cases of this disease have fallen under my observation—one of the rectum, one of the bladder. Of the latter, I

subjoin the following brief history, for which I am indebted to Mr. Quain.

CASE 3.—James J., aged 34 years, came under Mr. Quain's care in University College Hospital, in November, 1854. Upwards of three years previously, he first noticed blood in his urine; this had continued up to the present time, but now and then had ceased—once for as long a period as seven months together. After a time, symptoms resembling those of stricture supervened: incapacity to fully empty the bladder, incontinence of urine, and pain in passing his water. He had, in addition, pain and tenderness over the renal regions, especially the left, but none over the bladder.

At the *post mortem* examination, a florid red flocculent growth was found attached by a peduncle to the right side of the base of the thickened bladder. The kidneys consisted principally of the greatly distended pelves and calices; the ureters were also much enlarged. The liver appeared healthy. The heart was hypertrophied, the lungs congested. *No morbid growths were discovered in any other part of the body.*

I have retained the name "villous cancer" for this disease, rather from deference to the opinions of the eminent pathologists who have described it under that name, than from my own conviction. This conviction is, that it is not a constitutionally malignant disease: in a word, no form of cancer. This opinion rests on the following facts:—

1. No consecutive deposits of the same form of growth have ever been found associated with the original growth.

2. The cause of death from this disease is not from any general infection of the system, but from the local hæmorrhages, accelerated by intercurrent affection of the viscera.

It is a fact not unworthy of remark, that in most of the reported cases the hæmorrhage has not been constant, but has ceased at intervals: in the case narrated above, once for as long as seven months together. In all the cases occurring in the bladder, disease of the kidneys and their excretory apparatus has ensued—a fact not without its practical bearings, liable, as it is, to divert attention from the real seat of the disease.

There is reason to believe that two distinct species of growths have been confounded under the term “villous cancer:” one, a truly cancerous growth, for the greater part dense and solid, but terminating in some villous prolongations; a second, containing little or no solid material in its construction, but consisting nearly entirely of vascular, villous, pencil-like processes, and in many instances attached by a narrow peduncle, from which the villi radiate and spread out in all directions.

As an instance of the first, the following case from Rokitansky’s paper on the subject* may be quoted.

CASE 4.—A woman, aged 68 years, had original cancer melanodes of the right eyeball. After death, the liver was found “permeated by very numerous medullary growths, varying in size from a walnut to a fist, tuberosly prominent at the surface, partly pale, partly deep greyish brown, here and there also white.” Three large masses on the front border of the right lobe became gradually looser in texture, and terminated in “an aggregate of very loosely connected villi.”

The case observed by myself (*suprà*) offers a good illustration of the second, the simple form of the disease.

* “Ueber den Zottenkrebs, von Prof. K. Rokitansky,” in the “Sitzungsberichte der Mathematisch-naturwissenschaftlichen Classe der kaiserlichen Akademie der Wissenschaften. Bd. 8. Jahrgang, 1852. Wien, 1852.” Page 524.

3. Another great argument in favour of these views, is that in those instances, where the growth has been removed and the patient has survived the operation, it has not recurred. Professor Franz Schuh removed a "villous cancer" from the rectum of a woman in October, 1846.* In a letter, dated January 3rd, 1858, he writes me, "the patient's condition is the best imaginable." Professor Quain removed a typical specimen of "villous cancer" from the rectum of an old lady:† it has not recurred up to the present time, upwards of three years after the operation. Professor Schuh writes me of another case, in which he operated successfully two years and three months ago. This latter surgeon lost one patient from pyæmia, and a second from hæmorrhage, after the operation.

(5) OSTEOID CANCER (Müller, Paget). The osteoid order of growths has so unequivocally been proved to be of a malignant nature, that any further explanation of their position in the preceding classification is superfluous. The following case may be taken as a representative of the species.

CASE 5.—*Osteoid Cancer of the Femur : Death : Consecutive Deposits in the Lungs, Omentum, Diaphragm and Femoral Vein.*

James V., aged 55 years, a cattle dealer, was admitted into the University College Hospital, under Mr. Quain, for a tumor of the right thigh. He had suffered for the last two years from a dull aching

* Vide "Pathologie und Therapie der Pseudoplasmen, von Dr. Franz Schuh; Wien, 1854." Page 432.

† Vide "The Diseases of the Rectum," by Richard Quain, F.R.S. Second edition. London, 1855. Page 295.

in the lower part of the affected thigh, which caused him to limp in walking. The leg, too, would swell in the course of the day, but went down again in the night. Eleven months before his admission into the hospital, whilst leaning against a hurdle at a cattle market, a sheep ran its head against the lame limb; he fell, and the thigh bone was found broken at its lower third (by the sheep, he stated, not by the fall). The fracture was adjusted on a long splint, but united badly; so that all he could do after a time was to bear on his toes with the help of crutches. At a later period he met with a second accident: he was being wheeled about in a chair, when he was thrown out, and the injured limb, although not directly struck, was much shaken, and soon afterwards began rapidly to enlarge. He had noticed a distinct tumor for the last four months. On his entrance into the hospital, he had a large tumor, measuring 23-24 inches in its greatest circumference at the lower half of the right thigh; this tumor was of a stony hardness and resistance, excepting at its inner side, where it felt elastic. This latter part differed also from the rest of the tumor, in forming a kind of secondary, red, carbunculoid prominence, which at its centre displayed a somewhat sloughy, but yet not malignant looking, ulceration. The skin over the rest of the tumor, with the exception of a few dilated veins, appeared natural. The thigh above the tumor was much swollen, but felt sound. The inguinal glands were enlarged and tender. The outline of the patella could be easily defined with the finger. The whole leg and foot were swollen and somewhat brawny, but neither discoloured nor tender. The pain in the tumor itself had never been very acute, but had been much worse in the leg, where he compared it to "a thousand pins pricking" him. Two months before, the softer portion of the tumor had been lanced; about a couple of ounces of bloody serum came out. When Mr. Quain subsequently punctured it, only blood exuded.

He was not aware of any consumptive tendency in the family, but a grandmother and a sister had both died of cancer. He was an intelligent, tolerably healthy looking man, though his skin had a yellowish cast and numerous small varicose veins supplanted the color in his cheeks. He had been losing flesh for the last seven or eight months: this he attributed to confinement in bed; for he had

previously been a most active man, and was well known in his part of the country for his skill as a cricketer.

Such were the main facts of a case which may seem very clear to the reader of it, as it now stands, but which gave rise at the time to serious doubts as to its true nature. Was it a case of diseased callus, or was it cancer of the lower end of the femur? These doubts were soon destined to be removed. The ulceration of the skin at the inner side increased, exposing a fœtid, foul, greenish-black surface, devoid of granulations, which bled from time to time. He lost flesh rapidly, and got weak; his tongue became furred, and he complained greatly of thirst; his urine got loaded with urates, and his loins tender. Bed-sores formed over the left calcaneum, the right trochanter, and a considerable one over the sacrum. A large portion of the fungus sloughed away, attended with bleeding, which required the application of matico leaves to stop. Shortly before death his breath acquired that peculiar sickly sweet odour which has been supposed to be indicative of purulent fever.

POST MORTEM EXAMINATION, twenty hours after death. The lower part of the femur was enveloped and confounded in a large bony growth. The lower articular surfaces had remained intact, but beyond these the tumor had effaced all vestiges of the bone from which it had originated. Above the tumor was the rounded end of the femur, which hence upwards had preserved its pristine characters unimpaired from this, its point of fracture. The tumor was six or eight inches long, and about sixteen inches round: its surface was tuberos, its general outline round, but shelving off internally into a central depression, which was bounded outwardly by four large irregular nodulations of the surface. Into some parts of the tumor the knife sank, as it would into soft cancellated bone, but in others the shell of osteoid tissue resisted the passage of the knife altogether. Behind, the upper part of the growth was represented by a sloughy soft tissue, excavated in part, and containing some irregular bony fragments in its substance. There was no kind of transition whatever between the hard and soft parts of the tumor; the limits of each were abrupt. Some of the osteoid tissue was finely speckled by short streaks of opaque white in a more translucent, more yellow basis. A small portion of the section in the centre had a feathery

disposition of the bone. The section offered no indication whatever of the shaft of the femur in its substance. At the antero-inner side of the great tumor was a small outshoot of osteoid tissue upwards, firmly connected, but having no organic continuity with the upper sound half of the femur. There was a good deal of thickening of the subcutaneous tissues of the fore part of the thigh. The femoral artery was tilted forwards by a subjacent ossified mass of lymphatic glands. In about the middle third of the *Femoral Vein*, about an inch and a half from the upper part of the tumor, was an elongated osteoid deposit, about the size of a small bean, attached at its ends and on one side to the inner coat of the vein by a soft substance. *Brain and Membranes*:—Healthy. *Heart*:—Weighed $9\frac{3}{4}$ oz. Valves and muscular substance healthy. *Lungs*:—*Left lung* weighed $13\frac{1}{2}$ oz.; its whole surface studded over with plates of osteoid deposit. I counted on the outer surfaces of the upper and lower lobes respectively twenty and eighteen such plates; on the inner surface of both lobes, twenty; on the base of the lung seven: altogether, sixty-five. The smallest plate seen was about the size of the section of a mustard seed; the largest measured an inch and a half by an inch. The general shape of these plates was flattened superficially in conformity with the outer surface of the lung (above which they rose but very slightly), more nodular and irregular at their deep surface. Some deposits within the lung substance were altogether nodular in form. The superficial contour of the plates was mostly rounded, but sometimes trapezoidal. Around these the pleura was puckered into a number of fine radiating pleats, but the lung-substance itself was not drawn in, was crepitant and, to all appearances, quite unchanged; so that these osteoid deposits might be looked on in the light of simple foreign bodies imbedded in the pulmonary tissue. This in a measure accounted for the absence of all chest symptoms during the patient's life time. *Right lung* weighed $22\frac{1}{2}$ oz. On the outer surfaces of the two upper lobes, the number of deposits was twenty; on that of the lower lobe, sixteen; on the inner surfaces of both lobes, fifteen; on the base of the lung, ten; together, sixty-one; so that both lungs were pretty equally affected. At the outer aspect of the lower lobe, near the base, was a patch of pulmonary apoplexy, an inch and a half across, by two inches long. In all other respects, this lung agreed with its fellow. *Liver*:—To all appearances, healthy;

weighed 53 oz. *Kidneys*:—Sound. *Omentum*:—In its lower border an osteoid deposit, the size of an “agate” marble. The anterior layers of the omentum glided easily over it, but the posterior adhered round the diameter that separated its anterior and posterior halves. *Diaphragm*:—Above the left half of the cordiform tendon, lying in the very thin muscular substance, was a deposit of osteoid matter, resembling in size and shape an olive-stone.

Minute Anatomy of the various Growths. 1. *Tumor of the Femur*:

(a) The dense hardest osteoid tissue showed no definite structure, but an irregularly “loculated” appearance. (b) The less hard, but still firm osteoid tissue, exhibited, in fine sections an irregular, ill-defined fibrous arrangement of its elements; but, on the addition of hydrochloric acid, an abundance of carbonic acid bubbles were evolved, and, in a good many points of the section, a finely fibrous structure was brought out, which appeared due either to elongated nuclei or to fibres closely packed, and differed altogether from the microscopic characters of ordinary cellular tissue. No structure of true bone was observed. Some fibro-plastic cells and quantities of nuclei were seen in washings of the tissue. (c) The soft non-osteoid component of the tumor had no tendency to transition into the osteoid substance, where the two came in contact. Some of it bore a naked-eye resemblance to some varieties of medullary cancer. One portion is described in my note-book as “a stratum of a grey, somewhat translucent, soft, but consistent tissue, with points of hæmorrhage in it, and in no way differing from ordinary encephaloid disease.” Yet the microscopic characters of this latter were not those of cancer; it was, on the contrary, a true fibro-plastic development. (Pl. III., fig. 5.) All modifications of form of the fibro-plastic cell, nuclei varying in form from oval to fusiform, and multitudes of fine oil-globules, were its elementary constituents. Thin sections had a well marked fibrous appearance, from the parallelism of these elements; these were at some parts entirely fusiform nuclei, forming what might be not inappropriately termed a “nuclear” tissue. (Pl. III., fig. 6.)

2. *Tumors of the Lungs*:—The surface of many of these showed a spicular feathery structure, the spicula radiating from the centre to the circumference, with fine vessels running parallel between them: indeed, the great vascularity of some of these plates was remarkable.

A fine section of one of these plates showed a *true bony structure* (Pl. III., fig. 7). Other sections treated with hydrochloric acid, and examined with a high power of the microscope, displayed—(1) Fibrous structure, the fibres being all arranged in parallel layers, which often had a lacuniform arrangement—an approach to Haversian canals; studding the section irregularly over were seen very distinct lacunæ and canaliculi; (2) a “nuclear” structure, of the description mentioned *suprà*.

3. *Tumor of the Omentum*:—This had much the aspect of the tumor of the thigh, but was much more vascular; indeed, it resembled closely a portion of inflamed bone. The microscopic characters were also similar, excepting that the fibrous structure was much more distinct and that there were no cell-nuclei. A quantity of minute narrow nuclei were seen and here and there a solitary fibro-plastic corpuscle.

Throughout a laborious examination, of which the above are the results, no cancer-cells nor cancer-nuclei were observed.

Osteoid cancer is however occasionally associated with true encephaloid cancer. This was the case in some lungs, which Mr. Henry Gray, of St. George's Hospital, showed me. In these, my notes state, there was “firm, cream-coloured, hæmorrhagic encephaloid, conjoined with osteoid deposits. The encephaloid contained (1) cancer-cells of the most varied forms, (2) several fibro-plastic cells, (3) a great many cells intermediate in character between (1) and (2).” (Pl. iii., fig. 3).

It is a remarkable and significant fact, that growths, usually non-malignant, may *exceptionally* run a clinical course in all respects resembling that of cancer. I was hence induced in one of my writings* to propose the following classification of cancerous growths:—

* “Illustrations of the Pathology of Cancer.” London, 1856. Page 3.

Genus : MALIGNANT GROWTHS.—CANCER (*Auctoris*).

Species :

1. Scirrhus
2. Encephaloid } Cancer, *vulgo sic dict.*
3. Melanosis.
4. Nævoid Cancer (?) *Auctoris*.
5. Villous Cancer (?) (Rokitansky).
6. Osteoid Cancer (Müller, Paget).
7. Enchondromatous Cancer (*Auctoris*).
8. Colloid Cancer.
9. Fibrous Cancer (Paget).
10. Fibro-plastic Cancer (Velpeau).
11. Epithelial Cancer (Paget, Schuh).

However correct such a classification may be, pathologically considered, the interests of surgical practice will be better consulted in regarding the cases on which the 4th, 7th, 9th, 10th, and 11th species of this classification are founded, rather as exceptions to a nearly constant rule, than as so many new and rare species of cancer.

(a) NÆVOID TUMORS RUNNING THE COURSE OF CANCER.

Müller relates a case.

CASE 6.—A woman of cachectic appearance had a deeply seated tumor in the arm ; amputation was performed. This tumor consisted of “very considerable enlargements of softened blood-vessels and of blood extravasations.” In the course of half a-year she died. In the abdomen were found great masses of grape-like (*träubigen*) enlargements of vessels filled with blood.

He further illustrates the subject by reference to a case of Walther's, which not being very well known, I quote at some length.*

CASE 7.—A student had two congenital mother-marks on his right leg. One remained stationary; the other increased, and “at his twentieth year had a length of three inches and a greatest breadth of a little more than an inch and a half. It formed a flat tumor. The skin was here discoloured brown, playing into bluish; the surface of the tumor rough and uneven, permeated by many visible small vessels.” Professor Walther extirpated it. The operation wound was a long while healing, and the smaller tumor threw out small fungous sprouts in the subcutaneous cellular tissue; the cicatrix of the operation never broke out again. About three years after the operation, he had considerable hæmoptysis, which occurred repeatedly, and in eleven days more he died.

At the autopsy, Professor Mayer found in the “panniculus adiposus a mass of oval, reddish, pretty consistent” bodies or fungi, mostly arrived at the size of a bean—about twenty to twenty-five in number. Their simplest form was as follows: a process of the cellular tissue received a small vascular branch, which spread itself like a tree, and formed an oval vascular network. “Perfectly developed, they were consistent, externally and internally reddish, rich in blood, and showed, on section, some enlarged mouths of vessels.” “On a section of the lungs, there were perceived several round defined bodies, which felt hard, and consisted principally of enlarged blood-vessels. This enlargement of the vessels was exhibited still more clearly when the lungs were placed in spirit. Then it was seen that these enlargements of the blood-vessels were not limited to those bodies, but pervaded in a less degree the whole parenchyma of the lungs.” “When mercury was injected into the arteries, veins, and air-tubes, it made its appearance at the greatly enlarged mouths of the blood-vessels and the bronchia.” Professor Walther describes it as a case of fungus hæmatodes.

* Journal der Chirurgie und Augenheilkunde, von C. F. Gräfe und Ph. v. Walther, bd. v., p. 261. Berlin: 1823.

Cruveilhier* relates the following case:—

CASE 8.—A lady had on her head a dozen or so soft nœvoid tumors, of about the size of a large nut, pulsating synchronously with the heart. At the inner side of her left thigh was a similar pulsating tumor, the size of a fist; one surrounded the upper part of the right humerus; one was situate on the left shoulder; whilst another was connected with the anterior extremity of the third rib. The patient ultimately died marasmatic. After death, the tumors of the head were found to be generated in the osseous tissue (which was gnawed through) of the vault and lateral regions of the cranium. The tumor of the humerus had destroyed nearly all the adjacent bone. The tumors of the thigh and shoulder were developed in the soft parts. “All the pulsatile tumors were constituted by a cavernous tissue, whose fibrous areolæ were filled with blood. All the other organs of the body were healthy.”

Cruveilhier, in his most recent work,† denies the possibility of erectile tumors running a malignant course. He considers “that the pulsatile tumors of bone are constituted by a cancerous tissue, ordinarily encephaloid”; and, citing the above case, draws an “impassable line of demarcation between *erectile* tumors and *pulsatile* tumors.”

I have no doubt myself that all the cases which have been regarded as vascular tumors running a malignant course were really cases of encephaloid cancer, in which the vessels were developed in extraordinary number and degree. I am able to adduce a very remarkable case strikingly corroborative of this opinion.

* Cruveilhier's “Anatomie Pathologique du Corps Humain” (1829-35), liv. xxxiii., pl. iv.

† Traité d'Anatomie Pathologique Générale, par J. Cruveilhier, tom. iii. Paris: 1856.

CASE 9.—Edward W., aged 61 years, entered the Middlesex Hospital some years ago, for violent hæmatemesis, and, some time subsequently, for equally severe hæmaturia. Ever since he could remember, he had had a number of vascular tumors on different parts of his body. Over the outer third of the right pectoral muscle was one the size of a small walnut; above it were two smaller ones; over the right deltoid muscle, one about the size of a filbert. Above the right clavicle was one larger than either of these. He had a small one on the dorsum of the cleft of the right thumb, and one over the first phalanx of the left ring finger; several small ones about the neck, and one above the left clavicle. On the inside of the left angle of the lip were one or two, and on the mucous membrane of the inside of the cheeks, deep back in the mouth, were two or three of about the size of a pea on either side. The left half of the tongue was irregularly swollen out by venous growths. On the glans penis were several such tumors about the size of those inside the mouth.

Curiously enough, although suffering from the effects of fistula *in ano*, when I last saw him in the hospital, he had never had bleeding from the rectum, excepting twenty years ago, but appeared now to be subject to prolapsus of the anus. He was a good deal emaciated, and had a sallow flabby look about his face. Numerous minute varicose veins supplied the healthy blush on the cheeks; on these were several very minute vascular prominences.

These nævoid tumors varied considerably in appearance, and in their relation to the cutaneous structures. Some were entirely beneath the skin, under which they felt like rolling, round, encysted tumors, made but little prominence, and were rather appreciable to the sense of touch than to that of sight. Some, on the other hand, had that peculiar pale venous-blue hue of the subcutaneous nævi of children; whilst a third set formed rounded, thin, walled-dark purple tumors. They could all be partially emptied of their blood by pressure, filling again when this was removed. None pulsated in the slightest degree.

Here then we have a multiple dissemination of non-malignant tumors, which by their presence, in all probability, in the hollow viscera had given rise to severe local effects, but yet, after existing for years, had caused none of that undermining of the general health

so often observed in conjunction with a single cancerous tumor, to all appearances, comparatively to these venous growths, innocuous by its mere local effects.

(β) ENCHONDROMA RUNNING THE COURSE OF CANCER.

CASE 10.—*Enchondroma of the Testis: Operation: Death: Autopsy: Consecutive Enchondromatous Deposits in the Lymphatic and Vascular Systems, and in the Lungs.*

Henry Wynd, aged 37 years, received an injury to his back and his right thigh, two years before his admission into St. Bartholomew's Hospital, under Mr. Skey. Some swelling of the right testicle ensued; but this did not begin notably to enlarge till, a year afterwards, the organ got bruised by an iron bar falling on it. Before the patient was operated on, the testicle had attained a transverse circumference of ten and a half inches; was hard, heavy, and tender. The spermatic cord was similarly affected. After the operation, the tumor turned out to be an excellent example of enchondroma of the testicle, and to be composed of "tortuous, cylindrical, and knotted pieces of cartilage." The epididymis was healthy. The patient recovered well from the operation, but soon returned to the hospital, feeble and emaciated, exhibiting a breathlessness which, increasing, cut him off suddenly in less than three months after the operation.

At the *post mortem* examination, the spermatic lymphatic vessels were seen to contain deposits similar to those in the testicle,* and "became connected at their upper part with a swelling of the size and shape of a hen's egg . . . probably a diseased lymphatic gland . . . which adhered to the vena cava inferior . . . and projected into

* It is not often that we have an opportunity of anatomically demonstrating the presence of morbid material in the lymphatic *vessels*. Sir A. Cooper relates an instance of cancer of the testicle, in which "the *absorbents* of the spermatic cord were very considerably enlarged, their coats thickened, and small tumors appeared at irregular distances, arising from a diseased and enlarged state of their valves. These vessels were entirely impervious, and contained matter similar to that found in the testicle." The thoracic duct, receptaculum chyli, and lumbar glands, were similarly diseased. (Sir A. Cooper, in *Medical Records and Researches*.) Further on will be found a case of Epithelioma of the Scrotum, in which the lymphatic vessels of the neck were filled with epithelial deposit.

the cavity of this vein." "Beyond this point, no affection of the lymphatic system could be traced . . . the growth in the vein was branched like a stunted leafless shrub . . . and in direct contact with the venous blood." "Both lungs were enlarged by the formation in them of masses of cartilage in such abundance that the two lungs weighed eleven pounds and a-half." "In many of the larger branches of the pulmonary artery, small shrub-like growths, like that in the vena cava inferior, were attached to the lining membrane." No other organ of the body was found diseased. "The cartilage, in every seat of its growth, was of the true or hyaline kind." Professor Paget very kindly showed me the various preparations above referred to, and also gave me a section of one of the lungs, of which I subjoin the following description from my notebooks:—"The section was crammed with cartilaginous tumors, of the average size of a hazel-nut. They were connected but laxly with the surrounding pulmonary tissue, and could be easily and cleanly enucleated with one's fingers. Each was enveloped in a thin pseudocyst of cellular tissue, which, branching inwards, subdivided each tumor into a number of small lobes. The cartilage was blueish and translucent, cut like other cartilage, and agreed essentially in its minute characters with that of the ordinary cartilage of joints. The matrix of the cartilage-cells was finely nebulous; the cells themselves exhibited great variety of forms—round, triangular, elongated, etc., and filled limited lacunæ in the matrix. In some instances, the cell occupied but a small portion of the lacuna, in others it filled it, and in most cases each lacuna contained more than one cartilage-cell. This was well defined, and possessed generally a round dark nucleus, and a good deal of coarsely granular matter." (Pl. iv., fig. 1.)

The second case is that of M. Richet, reported in the *Gazette des Hôpitaux*, Nos. 71 and 95, for 1855.

CASE 11.—*Enchondroma of the Scapula: Operation: Death: Autopsy: Consecutive Enchondroma of the Lungs.*

A man, aged 34 years, had had a tumor growing on the right scapula for four years: by that time it had attained the size of a child's head.

M. Richet removed it, together with a considerable portion of the scapula. "The tumor originates from the bone, which it completely surrounds; it does not rise beyond the level of the spine of the scapula. It is inclosed by the periosteum. . . . It is composed of a tissue of a gelatinous appearance, but of the consistence of somewhat softened cartilage. This substance is homogeneous, transparent, traversed by filaments of fibro-cellular tissue, which appeared to sub-divide it into so many lobules or loculi.

"The microscopic examination, made by Messrs. Giraldès, Broca, and Verneuil, proved that the tumor was exclusively formed of large cartilage-cells and nuclei."

The man died a fortnight after the operation.

At the *post mortem* examination, at least thirty tumors were found in the substance and on the surface of the two lungs, some the size of a millet seed, the largest that of a nut. "This latter one offered all the external characters of an enchondroma; it was, in fact, cartilaginous tissue; and the microscopic examination, made with the greatest care by Messrs Broca, Giraldès, and Robin, proved that these tumors contained nothing but cartilage-cells."

Rokitansky, without offering any further explanation, states that he "has seen it (*enchondroma*), on several occasions, in the lungs;" and that "enchondroma is benign, provided it does not enter into any specific infectious metamorphosis."*

* Since writing this, I have received a letter from Professor Rokitansky, from which the following extracts are made:—"In those cases of enchondroma in the lungs, which I have seen, it was quite solitary." In the second paragraph, quoted above, from his work on Pathological Anatomy, he is especially alluding to those deposits of cartilage, met with in medullary cancers (*e. g.*, in the testicle). In regard to the two cases I have narrated in the text, he says:—"It is perhaps not well made out, that the enchondromata in the lungs were developed after the extirpation of the enchondromata of the scapula and testicle; they may perhaps have existed already simultaneously with those enchondromata of the scapula and testicle." It will be remarked that the Professor suggests a different interpretation of the facts of these two cases to that adopted by Professor Paget and myself. Which of these interpretations is more in accordance with the principles of inductive reasoning, I leave to my readers to determine.

(7) FIBROUS TUMORS RUNNING THE COURSE OF CANCER.

CASE 12.—Mr. Paget removed the breast of a woman, aged 47 years, for a large tumor of ten years growth, but which, having been struck seven weeks before Mr. Paget saw her, had increased so rapidly, and become so painful, as to induce her to submit to an operation. “The cut surface could not be distinguished from that of an ordinary fibrous tumor of the uterus . . . and microscopic examination could find nothing but a tough, compact, well formed fibrous tissue, with imbedded elongated nuclei.” Suffice it to add, the tumor recurred three months after the operation, sloughed out, and in about another two months she died, with a huge cavity in her breast. The point of the case, however, is, that, at the *post mortem examination*, both lungs contained between twenty and thirty small tumors, similar to the first and second tumors of the breast—“complete fibrous tissue.”

(8) FIBRO-PLASTIC TUMORS RUNNING THE COURSE OF CANCER.

CASE 13.—*Fibro-Plastic Tumor of the Orbit : Three Operations : Three Recurrences : Death : Autopsy : Consecutive Fibro-Plastic Growths in the opposite Parotid Region, the Dura Mater, and under the Pleura.*

Susannah Foster was 6 years old when she first came under my observation. This was on the 12th of October, 1853. Her parents brought her to University College Hospital, to consult Mr. Quain regarding a protrusion of her left eyeball. They said the child had been delicate from her birth, and had been much subject to coughs and colds, and to bleeding from the nose ; and, for the last three or four years, she was in the habit of sweating at night, and, three years back, had a bad cough with bloody expectoration. Her intellectual faculties had always been remarkably keen. For nearly two years a difference had been observed in the two eyes ; “the left one appeared slightly less than the right, rather drawn back, and a little turned.” Six weeks before we saw her, she fell on the front of her head, and from that time onwards the left eyeball was noticed protruding. The left eyeball now protruded considerably, was at the same time

turned downwards, and felt rather harder than the right one. The pupil acted well and vision was perfect. The upper eyelid was suffused, and its veins were enlarged. The child pointed to the outer canthus, and said "it pricked her." She was a fair-haired little girl, with a thin delicate skin, long eyelashes, and prominent upper lip, and was remarkably acute and intelligent. Strange to say, the child outlived both her parents; for the father and mother died of phthisis during the progress of her case. In the father, Dr. Peacock writes me, "there were decided evidences of tuberculous deposits at the upper part of both lungs." A letter from the mother's medical attendant, Mr. Luke, informs me that "she died of phthisis." I, on one occasion, saw one of her brothers and three of her sisters; they appeared to me healthy children, had delicate fine skins, and blue eyes. Between this report and the following one, the protrusion of the eye increased—remarkably so in the week preceding her entrance into the hospital. This was on the 29th of November, 1853. Three days before, the child had been playing about as usual, and up to that time her eyesight had remained good (her father told me "he had often tried her sight," and thought, if there *was* any difference, she saw the better out of the protruded eye); but on the evening of that day, after the child had been put into bed, she became restless, and complained of pain in the head (apparently the left side only) and eye, and in the lower part of the abdomen. Since that, her mother said, she would start up suddenly in bed, lay herself down again, and then begin rambling. The eye had been discharging offensive matter.

The following are the chief facts in her diary whilst in the hospital.

Nov. 29th, 1853.—She was admitted. The left eyeball protrudes about one inch beyond the level of the right one; the eyelids are lividly red. The ocular conjunctiva is, in its upper half, slightly injected; in its lower half, dusky red and chemosed. Exposure to the light gives her most intense pain. As far as then can be ascertained, the cornea, anterior chamber, and iris, appear sound. Towards the outer half of the upper eyelid is felt a tolerably moveable plate, of the consistence of cartilage. On questioning her as to where she feels pain, she points to a spot on the temple, just at the outer canthus.

Dec. 3rd.—Since the last report, the child has been quite freed from pain by small doses of laudanum. She is to be operated on to-day. Half-an-hour before the operation, her pulse is 120; respirations, 30; tongue moist, coated with a white fur; skin dry and hot.

Operation by Mr. Quain:—Chloroform was administered. The outer commissure of the eyelids was divided, and an exploratory puncture made into the orbit; the grooved needle was felt to enter some solid resisting substance. The eyelids were now separated from the contents of the orbit by dividing the palpebral sinuses. The eyeball was then removed. A vertical section through it showed it to be unimplicated in any disease. The mass of the tumor behind it in the orbit was now removed, then some other small portions of the growth, and a small part of the optic nerve. The hæmorrhage was not great. The orbit was plugged with lint, and a compress applied.

Examination of the Growth:—It was about the size of a walnut, in form rounded, with one or two lobes on its surface. It cut very firm, its sharply defined section was of a dirty yellowish grey colour, much like that of the grey substance of the brain, only of a deeper hue; there was not the slightest translucency in the tint, which was opaque and dead, and the whole surface had a remarkably uniform homogeneous appearance, excepting a slightly elevated and lobulated nucleus of a rather lighter colour than the adjacent portion of the growth; there was but a single red point, about the size of a pin-head, on the section; otherwise not the slightest trace of vascularity was to be seen.

In tearing out fine shreds with needles for the microscope, the tissue of the growth was found to be very tough, and not to exhibit any tendency to tear in any one particular direction.

Minute Anatomy:—Three chief elements constituted the mass of the growth:—

1. Fibres intersecting one another in all directions.
2. Nucleated laminae of various forms and sizes.
3. Large quantities of well defined circular nuclei, lying amongst intermediate granular matter, and presenting a fine outline and a homogeneous "stumped" aspect.

Besides these, was a very fair number of *cells*, in some cases circular, in others elongated in various degrees. Of true fusiform cells, only

two were observed, and those imperfect in their development. And, lastly, there were a few oat-shaped nuclei, which, however, presented no definite arrangement to one another.

Not a single cell had any of the characters of the so-called "cancer-cell."

The case went on quite favourably, till about the fifth day after the operation, when a smooth, oblong (half an inch long) moderately vascular fungoid growth was noticed projecting from the outer half of the lower border of the upper eyelid.

Dec. 13th.—The fungus of the eyelid has been rapidly increasing in size from day to day.

Dec. 17th.—The patient continues in excellent health and spirits. The palpebral fungus has not sensibly altered, but a *second* tumor can be felt above it under the skin of the eyelid, just below the eyebrow. This latter growth is a hard, resisting (non-elastic) swelling, perfectly distinct from the fungus of the lower edge of the eyelid.

Dec. 28th.—The upper palpebral tumor is much larger.

Feb. 10th.—The upper tumor of the eyelid has now reached dimensions of two inches by one inch. The lower fungus remains stationary. Mr. Quain to-day removed the tumor of the eyelid, leaving, however, and dissecting off the skin of the part. The growth was found in the operation to be intimately connected with the periosteum of the orbit.

Examination of the Second Growth:—It was somewhat larger than the previous orbital growth, and stated by the operator to be very intimately connected with the periosteum of the orbit; no section was made of it, but the characters of its substance, where it had been cut in its removal (with the exception of the "nucleus" there referred to), is so completely identical with those of the original growth, that the description given of the obvious physical qualities of this latter may be taken as accurately portraying those of the one now under consideration.

Minute Anatomy:—On submitting a very fine section, made with a razor, to the microscope, it was found to be composed of irregularly intersecting fibres, which at the outskirts, projecting beyond the general outline of the section, were seen to possess all the optical properties of ordinary cellular tissue. On the addition of acetic acid, many parts of the section exhibited large quantities of the so-called

“oat-shaped nuclei” quite similar to those observed in the original growth; but, besides being very much more numerous, they were seen to be arranged parallel to one another in the most regular possible manner.

A very fair number of rounded, mononucleated cells, too, and here and there some genuine well-characterised fusiform (fibroplastic) cells were observed.

The child left the hospital with the wound of the operation healing, and in excellent health; but for two or three days before her departure, a small nodule made its appearance just below the outer canthus; and by the 25th of March this had extended below the under margin of the orbit inwards, and had reached the size of a horse-bean.

This third tumor grew rapidly, and was removed by a third operation. It nowise differed anatomically from the preceding two.

I saw nothing more of the child till January 30th, 1854, when her mother brought her back to the hospital. She had continued quite well after the third operation, till within the last two months. Then the tumor recurred in the eyelid, and an entirely new growth sprang up in front of the right ear. The following is a report of her condition at the above mentioned date. At present, the left upper eyelid is the seat of three tumefactions, one above and two below, separated from each other by the τ -shaped scar of the operations. The inner of the lower two tumors is of a very dark dusky, venous hue, and feels rather soft; the two other ones are harder and not so dark. They have given her no pain. In front of the right ear is a diffuse tumor firmly attached to the subjacent parts, and apparently connected with the zygoma; it reaches to and involves the antihelix, and in this way narrows the meatus auditorius externus so much, as to give rise to considerable deafness. It was the size of a pea, when the mother first noticed it: it now measures two inches by two inches; it feels very hard and resisting; the skin over it retains its natural colour. There is some discharge from the ear, and she has been much troubled with the earache, not with any headache. The left nostril is much stuffed, and blowing it gives her pain; it has bled several times. An examination reveals only some redness of the mucous membrane. The child is otherwise well and very cheerful; she has an excellent appetite, and has kept up her flesh.

Feb. 8th. A hard tumor has formed behind the pinna of the ear continuous with that in front of that organ: this posterior swelling measures two inches vertically, and seven-eighths of an inch across.

Feb. 13th. The progress of the growth is truly surprising. A fresh tumor has formed over the bridge of the nose and above the left eyebrow—extensions of the palpebral tumor. Her health is beginning to fail her. She appears to me and to her parents to have lost flesh since I last saw her; she sleeps badly; her appetite is gone; the tongue is coated. She suffers a good deal of pain in the anterior part of the aural tumor. The right eye waters a little and its vision is somewhat impaired.

March 10th. The following measurements will speak for themselves as to the astonishingly rapid progress of the tumor. *Parotid Tumor*.—Vertical measurement, $3\frac{1}{2}$ inches; horizontal measurement, $3\frac{3}{4}$ inches. The *Fronto-Palpebral Tumor* occupies now the entire left half of the forehead and root of the nose; it measures, from side to side, $2\frac{1}{2}$ inches; and reaches, from the level of the eyebrow upward, $1\frac{1}{2}$ inch.

May 19th, 1855. Up to shortly prior to the present date, I had had the child as a patient at the Farringdon Dispensary, but about this time her father died, and her mother moved to another dwelling; and I therefore got her again into University College Hospital, where she died on the 30th of October, 1855. On May 19th, I have the following notes. *Parotid Tumor*:—Vertical measurement, $5\frac{3}{4}$ inches; horizontal measurement, $6\frac{1}{4}$ inches. *Frontal tumor*:—Vertical measurement, $4\frac{3}{4}$ inches; from middle line above eyebrow to within an inch of ear, 6 inches. There is great uniform glossy lividity of the parotid tumor, and over the orbit: where no such lividity exists, there the subcutaneous veins are greatly enlarged. In front and behind the right ear some desquamation of the cuticle has taken place.

Up to the period of her death, she gradually sank into such an exhausted condition, as to preclude the possibility of taking any further exact notes of the case. Pectoral symptoms too supervened, indicative of consolidation and partial softening of the lung tissue. On the evening of the 30th of October, 1855, she breathed her last.

POST-MORTEM EXAMINATION, Oct. 31st, 1855, 3 P.M. *Head. Parotid Tumor* :—After the skull had been cleared of all the soft parts, excepting the morbid growths, the parotid tumor was found attached to the parotid, mastoid, malar, auricular (and slightly the occipital regions), and to the side of the superior maxilla, approaching within half an inch of the outer margin of the orbit. The pinna of the ear was greatly enlarged and thickened by infiltration with the morbid material. The shape of the tumour was circular—that of a bun—with the convex face turned outwards, and unattached. Its diameter in any direction was 6 inches. It felt hard and resisting, excepting behind the ear, where a small portion felt softer, and had a mamillated appearance. *Palpebral Tumor*.—It was formed by a great thickening and deformity of the left eyelids by the morbid deposit. The eyelashes still remained, though inverted and concealed by the diseased state of their supports. The tumor thus formed was divided into three or four divisions, which closed the anterior aperture of the orbit; but, on removing the roof of this cavity, only a trace of the morbid deposit was found on its floor. The frontal tumor was an extension of the palpebral, and, occupying principally the left frontal region, encroached on the upper half of the nose. The frontal and palpebral tumors, taken together, measured 6 inches across, by 7 inches from above downwards. The frontal tumor reached also beyond the middle line, slightly into the right frontal region.

The tumors above described, parotid and palpebral (frontal), had no connexion with one another.

On the skin being reflected from both these tumors, they presented the following characters. Of a dirty greenish grey colour, firm, consistent, and homogeneous; destitute of vascularity or hæmorrhages. Excepting the green tint* (which may perhaps have been, to a certain degree, *post-mortem*), the physical attributes of these growths agreed remarkably with those removed during life. The skin covering the tumors was considerably involved in the deposit, but the cranial bones appeared free from disease. *Brain* :—Healthy, excepting at one point of its surface, where it corresponded to a tumor of the dura mater; here the cerebral substance was depressed, and in part

* Fibro-plastic tumors possessing a *green* tint, have been designated by some authors (*e. g.*, Mackenzie,) as “chloroma.”

wasted. *Dura Mater*:—Attached to the cerebral aspect of the dura mater, investing the base of the skull (in the right middle fossa, corresponding with the posterior extremity of the petrous portion of the temporal bone), was a tumor, of the size of a walnut, and having all the external characters of the growths previously described. On raising up the dura mater, small points of the tumor were seen penetrating to this aspect of the membrane, and the subjacent bone was found rough and worm-eaten (not carious). *Thorax. Right Lung*:—Weighed 11 oz., somewhat shrunken. The upper, middle, and upper half of the lower lobe, felt as if infiltrated by some hard tuberculous deposit of some kind. On cutting into the lung substance, this was found consolidated and grey—in fact, presenting all the appearances that would be expected in old chronic pneumonia. On examining a portion of the lung tissue more closely, I found it studded here and there with what appeared to me to be small deposits of yellow tubercle. With the microscope, after the addition of acetic acid, narrow bundles of intersecting fibres (original lung tissue), exudation corpuscles, indefinite cells, and quantities of fine granules, were the elements noted. *Left Lung*:—Weighed $6\frac{1}{2}$ oz.; exceedingly small, and shrunken to an extreme degree; firmly bound by old pleuritic adhesions; both lobes consolidated, as in the right lung; about an ounce of straw-colored serum in the pleural cavity. *Bronchial Glands*:—Enlarged. On cutting into one of these enlarged glands, it was found grey and softened, but yielded no juice on pressure. With the microscope, myriads of round, slightly granular corpuscles, less than those of the blood, were seen (lymph corpuscles?). Beneath the *right costal Pleura* of the vertebral extremities of the eighth, ninth, and tenth ribs, and along the sides of the bodies of the corresponding vertebræ, was found a flat deposit (3 inches long, by $2\frac{1}{2}$ inches broad, and about $\frac{3}{4}$ thick), of material identical in its physical characters with those of the cranial growths. *Abdomen. Liver*:—Very pale and yellow. *Kidneys*:—Very diseased; extremely hard and tough; apparently consolidated by interstitial fibrinous exudation. *Intestines*:—Very transparent, and distended by flatus.

Minute Anatomy of the Parotid Growth:—(1) Large masses of parallel waved fibres, well seen after steeping portions of the growth in chromic acid solution. (2) Elongated narrow nuclei, parallelly

arranged, and best seen after the addition of acetic acid. (3) Fibro-plastic cells in fair quantity. (4) Cells about the size of blood corpuscles, round, with a granular nucleus. The basis of the growth was evidently fibrous. No cancer-cells were observed.

The preceding account of the microscopic characters agrees essentially with what was observed independently by Professor Quekett in some portions I brought him to examine.

Mr. Paget had, in 1853, reason to "suspect cases (of myeloid tumors) may be found in which . . . a malignant course is run."* Since the time he wrote this, this suspicion has become a certainty—the occasional malignity of fibro-plastic tumors must now take its rank amongst the best established surgical doctrines. M. Lebert has collected six cases of the kind, the main features of which are given in the following tabular exposition:—

* *Op. cit.*, vol. ii., p. 225.

M. LEBERT'S CASES OF MALIGNANT FIBRO-PLASTIC TUMORS.*

No. of Case.	Age (when the tumor first appeared).	Locality.	Operation; its date after first appearance of tumor.	Local return of the disease.	Died after last operation, in:	Consecutive Deposits.
1	16 years and 2 months.	Left epididymis.	Excision; 11 months.	—	One month of marasmus.	Vast tumors in left inguinal and lumbar regions; multiple tumors in peritoneum, diaphragm, and pleura. In lungs (?) and surface of liver.
2	40 years.	Two subsynovial tumors on—1, external condyle of femur; 2, on head of tibia.	Amputation; 3 years.	—	Two months with pulmonary symptoms.	Twenty-seven fibro-plastic tumors in the body, viz.: 3 in the meninges, 1 in the left breast, 18 in the pleurae, 5 in the body of the uterus.
4	34 years.	Popliteal space.	Extirpation; some years after.	1½ month after extirpation in cicatrix and inguinal glands.	Five months with pulmonary symptoms.	Enormous tumor in popliteal space, inguinal, crural, and lumbar glands; multiple tumors in lungs and pleurae.
5	29 years.	Middle of right thigh.	First removal (Oct. 1848); 14 months.	Five times in the course of one year; amputation in Jan. 1850; return in stump four months afterwards.	One year and 8 months with pulmonary symptoms.	Vast tumor of mediastinum; tumors in lungs, pleura, inguinal and bronchial glands, and abdomen.
6	24 years.	Bones of feet.	—	—	? with pulmonary symptoms.	Multiple tumors in lungs, pleurae, bronchial glands and diaphragm.

* *Traité d'Anatomie Pathologique*, par H. Lebert. Paris: 1855. (P. 194.)

M. Léopold Ollier narrates a case of *Fibro-plastic tumor of the back, accompanied by consecutive tumors in the inguinal region, both lungs, and the liver*. The tumor in the back had been removed by the *écrasement linéaire* of M. Chassaignac. M. Delore "found in it only fibro-plastic elements." In the lungs were "little masses of a yellowish white material, pulpy and very soft." In the liver were tumors with "the same outward characters." "In the right inguinal region existed a fluctuating tumor, full of sanguineous serosity and fibrinous deposits." The above description is much more in accordance with that of a case of an encephaloid than of a fibro-plastic tumor. The figures M. Ollier gives of the microscopic elements agree more with some of the forms of caudate cancer-cells I have seen, than with those of typical fibro-plastic corpuscles; they are, at any rate, open to doubt, as is indeed the whole case.*

Dr. Follin, in a recent letter, writes me, that "since that time (viz., the publication of Lebert's cases), we have had on more than one occasion the opportunity of observing analogous facts in the Paris hospitals."

The following case, which occurred in the practice of Mr. De Morgan, is intermediate in its characters between those given under the heads (7) and (8):—

CASE 14.—An old man, aged 65 years, of a muscular frame and florid complexion, had a very large tumor at the lower end of his left thigh. It was about the size of a walnut when he first observed it some two years before, but had since progressively increased to its present size. There were no inguinal enlargements. He had suffered

* *Recherches Anatomopathologiques sur la Structure intime des Tumeurs Cancéreuses aux diverses périodes de leur Développement*, par Léopold Ollier. Montpellier 1856. (Page 88.)

occasional "scalding" pains in the part. There was no cancerous predisposition to be traced ; but some of his brothers and a sister had died of phthisis. This man died from the effects of chloroform, administered for the purpose of amputation of the thigh. At the *post mortem*, a tumor was noticed on the left arm, which, somehow, had escaped notice during life, one in the substance of the liver, and some deposits in the lungs. A section of the tumor of the thigh presented all the naked eye characters of a *fibrous* tumor (*propr. sic dict.*), just as is observed in ordinary fibrous tumors of the uterus. At one spot, however, a considerable hæmorrhagic effusion had occurred into the substance of the growth. The microscopic characters of the tumor were equally distinctive. Large quantities of fibres, for the most part parallelly arranged, constituted the main element. Some few fibro-plastic cells, here and there an elongated nucleus (brought out by acetic acid, which effaced the fibres), and a number of fatty molecules, were the secondary elements. Not a single cancer cell could be seen. The tumor from the arm was about the size of an olive, and its section was characterised by numerous pearly fibres concentrically arranged. It had under the microscope an indistinctly fibrous structure, but acetic acid developed quantities of round and elongated nuclei, the latter with their long axes in the same direction. In a word, it was a most typical specimen of a *fibrous* tumor. The growth in the liver, on the other hand, differed from the two preceding ones, in having the properties, not of a fibrous, but of a *fibro-plastic* growth. It was about the size of a filbert, cut hard with a section of a uniform dead white, with points of translucency here and there, and devoid of any sanguineous staining. A mass of fibres was seen in the field of the microscope, and after the addition of acetic acid, a number of nuclei, some spheroidal, some fusiform and narrow. In the lungs were some irregular deposits, resembling exudation-matter, consisting of a great many fibres, mostly of an elastic nature, and what appeared to be a few oat-shaped nuclei.

(e) EPITHELIOMA RUNNING THE COURSE OF CANCER.

Notwithstanding the frequency of epithelioma, cases of this disease running the course of cancer are

extremely rare. It has not yet fallen to my own lot to witness such a case. In the museum of St. Bartholomew's Hospital is a preparation (Series xiv., 61):—"Portions of lungs with masses of epithelial cancer." Mr. Paget has mentioned the case at page 448 of the second volume of his *Lectures on Surgical Pathology*. "It occurred in an old man whose penis was amputated eighteen months before death. The inguinal glands were found, after death, infiltrated with epithelial structures. In the lungs were about twenty epithelial growths. "Their minute structures accorded exactly with those in the inguinal glands, not a character of the epithelial cancers (?) were wanting."

A few other similar cases have been recorded by different authors.

I may here mention a remarkable fact, to which Mr. Butcher has more especially directed the attention of surgeons, in a paper on the "Cancerous degeneration of warty excrescences," published in the twenty-second volume of the *Dublin Quarterly Journal for Medical Science*. It is this:—*Epithelioma may undergo an encephaloid degeneration*: this adventitious product then follows the usual course of encephaloid cancer, and leads to consecutive deposits of that growth. I have seen such an instance myself.

CASE 15.—*Epithelioma of the Cheek: its encephaloid degeneration: Consecutive deposits of Encephaloid Cancer in the lungs.*

A man, sixty-two years of age, had two years before observed a "pimple" inside his cheek; this was followed by other pimples, "seemingly all from one focus." When I first saw him there was a shaggy

papillary development on the buccal mucous membrane. This growth had been repeatedly touched with lunar caustic without any permanent relief. I lost sight of him for some time, again to see him a patient in the Middlesex Hospital under Mr. Shaw. His appearance had so changed that it was some time before I recognised him again: the whole cheek was greatly swollen, the epithelial growth inside his mouth had degenerated into a foul malignant ulcer; the submaxillary glands were greatly engorged and of stony hardness; he was emaciated and suffering most acute pain in the parts. He soon died. The buccal tumor was found to be an encephaloid cancer; in the lungs were numerous tumors, varying in size from that of a pea to that of a pigeon's egg, of the same disease. I subsequently saw a man affected with a disease precisely resembling the first stage of the preceding one.

Facts of this kind throw a doubt on all the alleged instances of the consecutive dissemination of epithelial growths, which have not been examined microscopically, and furthermore, impress upon the surgeon the necessity of *removing all such tumors completely in their earliest stages.*

Notwithstanding the objection that attaches itself to the term, "Semi-malignity," surgeons cannot but have noticed from time to time cases which are malignant in the sense Mr. Travers took the word, namely, "*incurable,*" though not so in the wider acceptation of the word, which we, in conformity with the received more extended notions of the day, have admitted.

CASE 16.—In October, 1852, a middle-aged woman was in University College Hospital, for an ulceration of the lip; the ulcer had a sloughy, unhealthy aspect, and sharply cut edges; the substance of the lip around was a good deal indurated, and these objective facts were accompanied with the most distressing subjective sensations in

the shape of agonising pains, radiating from the lip up the side of the face to the eye. No treatment had any permanent effect on the sore: it was cauterised several times with the chloride of zinc paste, and had once or twice in this way nearly cicatrised, but to again break out with redoubled vigour, and destroy in a few days what it had taken as many weeks to form. I have seen several such cases.

A very remarkable form of disease, apparently belonging to the same category, is exemplified in the following cases:

CASE 17.—*Tuberculated Disease of the Nose: not Irregular Menstruation.*

Eliza H., aged 18.—Her mother died of consumption. Her own general health is bad; has had a short hacking cough for some time past; sweats at night sometimes; expectorates a good deal; has spat blood; suffers a good deal from indigestion; feels very sick at times. Catamenia did not appear till she was 17; they are irregular now. Occupying the whole tip of her nose is a large mass of dusky red mamillated tuberculations, coated, in some places, with scabs of dried blood, in others with concreted discharge. She often experiences gnawing and throbbing pains in the part; the slightest touch has sometimes set it bleeding. The most varied treatment has done it no good. Ten years ago she had a precisely similar condition of her upper lip, of which, after various and severe treatment in different London hospitals, she got eventually cured. The whole of this latter part still retains a glossy bulging appearance, the natural dimplings of the integuments having disappeared. The disease in the lip lasted nearly eight years, and shortly after it was cured, the disease reappeared in its present situation.

CASE 18.—*Tuberculated Disease of the Nose: Defective and Irregular Menstruation.*

Harriet M., aged 20, was admitted the latter end of August, 1854, into the Middlesex Hospital, for an obstinate affection of the extremity of the nose. Up to the previous January, excepting occasional giddy

headaches and an habitual chilliness, her general health had been good, when for the first time the catamenia made their appearance; she states she "caught cold on them," that they then ceased, and that simultaneous with their cessation, the disease of the nose commenced; since then the menses have appeared but scantily two or three times in the course of the year, at irregular periods. There is no tuberculous tendency apparent either in herself or family; she has a somewhat bloated, but not decidedly unhealthy look, nor is she at all anæmic. She had often had "a cold in the nose" before, but generally, soon managed to get rid of it by applying a little grease to it; but this last time she was unable to cure it, and it has gradually ran on to its present condition. The diseased action manifested itself first in the right half of the end of the nose by redness and swelling, and it was not till two or three months after that the left half became affected. The tip and alæ of the nose, the nostrils, and upper lip are red, swollen, and studded with patches of irregular shallow ulcerations of an ashen-yellow sloughy aspect; some small livid tubercles are scattered over the diseased surface, and are especially numerous about the confines of the ulceration. The least touch has set the surface bleeding, though to no considerable extent. She has suffered hardly any spontaneous pain in the nose; but of late it has become exceedingly tender. Treatment has had hitherto but little effect on the disease; on the whole the local application of the Tr. Iodin. has done the most good. After she had been in the hospital nine months, the disease had extended in a slightly oblique line from each ala of the nose to the corresponding half of the upper lip. The posterior half of the hard palate, and as much as could be seen of the soft palate, were studded over with small tubercles. Her menstruation had not improved, although her general health was good. She had been taking Fowler's solution and chlorate of potash—the latter was likewise externally applied—without deriving any benefit.

CASE 19.—*Tuberculated Disease of the Nose: Irregular Menstruation.*

Emma N., aged 16.—Entered the Middlesex Hospital, for an obstinate ulceration of the nose. She was not aware of any hereditary predisposition to scrofulous or cancerous maladies. With the exception of occasional head-aches, her general health has been

good; her bowels act regularly, and her appetite is good. The catamenia began some time before she was fourteen, but have not continued regular.

The present disease of the nose began, as far as she is aware of, spontaneously; first inside the nostrils, and then gradually making its way out, till it now—one year after the first appearance of the disease—occupies the tip of the nose, both alæ and the nostrils. These parts are swollen and the seat of a mamillated irregular ulceration; they have bled if struck, but not otherwise; she experiences no pain. She left the hospital somewhat improved.

I have seen several other instances of this disease—for which I have proposed the name "*Lupoid Ulcer*," (vide *Lancet*, 1856)—mostly on the nose, but in one case on the cheek, in another on the buttock. It generally occurs in young women, whose menstruation is more or less faulty.

In the above cases, the disease showed little tendency to spread; it was characterised not by any rapid progress, but, having once attained a certain degree of severity, by an obstinate resistance against any remedies employed for its amelioration.

For such cases as the above, the term "semi-malignant" is a convenient one: they are not malignant (*i.e.*, cancerous), but differ from the simpler forms of morbid deposits and ulcerations by their great intractability and their tendency to recurrence after apparent cure: they seem to form a sort of connecting link between the simple and truly malignant species of diseases under consideration. The first case given above approaches most closely to the lupus "*qui détruit en profondeur*" (*Cazenave* and *Schedel*); the others are of a very anomalous nature; I doubt whether they have been described by authors.

CHAPTER II.

THE PATHOLOGY AND SYMPTOMATOLOGY OF CANCER.

IF there be any one question that comes before the surgeon more difficult to decide, and, in the decision of which a greater experience, a greater intuitive perception is required than in most others, it is assuredly that of the diagnosis of certain tumors, with reference to their benignant or malignant character. This decision fortunately does not, as a rule, affect the treatment to the extent it does the prognosis; this latter, however, in the great majority of cases, depending, as it does, entirely on the diagnosis, and involving, to state the case broadly, the question of life or death, acquires an altogether special and absolute—not contingent—import in reference to the class of diseases under consideration. Errors in diagnosis are by no means uncommon—at any rate, before operations—even amongst the best surgeons. This is, we think, to be often ascribed to their allowing themselves to be carried away too hastily by that intuitive perception before alluded to, which an extended experience may have given them, and from the low estimation which many otherwise excellent practical surgeons evince for the aid of the microscope in assisting their judgment. It may be safely asserted that there is, perhaps, no problem in the whole range of surgical

science which requires more for its solution a knowledge not only of the truth, but of the *whole* truth, than does the one at issue—none in which a more correct valuation of the individual truths in relation to each other. “Accurate conclusions can only be arrived at by investigating *all* the circumstances of the individual case.”—(*Bennett*.) Admitting that the importance of the minute anatomy of growths has been greatly overrated by certain devotees of the microscope, that still it often is a material aid in the solution of the nature of doubtful cases cannot well be denied. I cannot help remarking however that, notwithstanding the immense mass of microscopic observations of morbid products that we possess, their value is in a great degree depreciated by the indifferent acquaintance observers often seem to display of the intimate structure of the natural tissues in which the growth has occurred. Of the many persons who examine cancerous breasts with the microscope, how many are acquainted practically with the microscopic elements of the healthy breast? Feeling such a deficiency myself, I some years ago examined into this point.*

Following out the principle insisted on *suprà*, of enlisting *all* the available points in a case, we will

* The breast, when examined at the period of lactation, will be found to consist of a number of lobules, which by careful dissection under simple lenses, may be separated into still finer ones, these into still finer ones, and so on till we arrive at the ultimate lobules, which are about the size of a very small pin's head. Between all these lobules down to their finest subdivisions runs a filamentous tissue, which the microscope shews to consist of the characteristic waved fibres of ordinary cellular tissue. An ultimate lobule examined under a $\frac{1}{4}$ -object glass, presents a festooned border, each dilatation representing what may be termed an *ultimate vesicle*, which itself consists of a basement membrane and a layer of epithelium of

consider them severally, according to the following scheme:—

I. AETIOLOGY.

A. *Concomitant Circumstances.* (“*Predisposing Causes.*” *Auctorum.*)

1. Hereditary.
2. Personal. Sex—age—previous health.

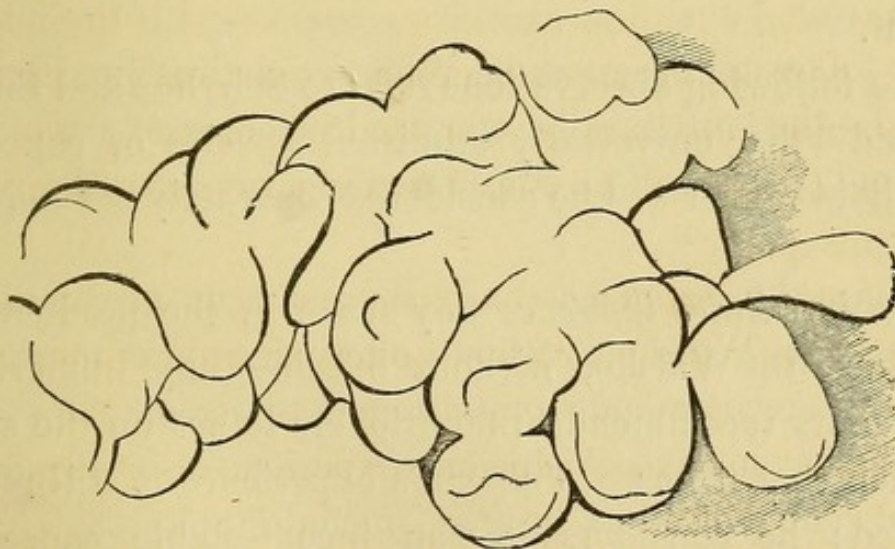
B. *Exciting Causes.* (?)

II. SYMPTOMATOLOGY.

A. *Special Previous History.*

1. Progress of growth.
2. Patient's general health during that progress.

the spheroidal variety, with small circular nuclei and dotted nucleoli. The subjoined figure represents the ultimate vesicles of the gland drawn *ad naturam* by the aid of the camera lucida.



OUTLINE DRAWING OF THE ULTIMATE VESICLES SEEN UNDER A $\frac{1}{4}$ -OBJECT GLASS.

The vesicles had a tessellated appearance, as if further subdivided, and here and there black points (nucleoli of the epithelium scales).

When such a group of vesicles was torn up with fine needles, the walls of the vesicles were found to consist of fine waved fibres (which vanished under acetic acid) and what appeared to be a layer of cells.

B. *Condition of Patient when first brought under observation.*

1. Local Phenomena. (Consistence and aspect of growth — pain — hæmorrhage — discharge, &c.)
2. General Phenomena. (Cachexia—wasting, &c.)

C. *Anatomy of the Tumor.* (*Vide* Chap. III.)

1. Naked Eye Characters.
2. Microscopic Characters.

In the discussion of these several points, I shall avail myself, in the first place, of the valuable works of Lebert, Paget, Bennet, Walshe, Velpeau, &c., and some of the older observers, as Wardrop and Hey; and, in the second place, of cases which I have observed myself.

The following observations refer to Scirrhus and Encephaloid—the universally admitted species of cancer;—Colloid cancer will be considered separately at Chapter IV.

Has *hereditary influence* any share in the production of cancer? Walshe, without offering any numerical statement, recommends practitioners to act on the supposition that it has. Velpeau's experience is still more decided: he considers it "an incontestable cause of cancer," and has observed it in more than a third of his patients. He relates a case of three sisters, who were each afflicted with cancer of the breast, of which affliction the mother died.

Warren gives perhaps the most remarkable case on record of cancer running through the members of a family. "The grandfather died of a cancer of the lip. The son had a cancer of the breast; two of his sisters had cancer of the breast. A daughter of one of the ladies had a cancer of the breast, which I (Warren) removed at an early period; she died some years after of cancer of the uterus. A daughter of the gentleman has a cancer of the breast."

Bayle gives several analogous examples, but is by no means disposed to believe in the hereditary nature of cancer as a settled dogma.*

M. Lebert states that "he sought with much care for hereditary predisposition in 102 cases, and found it in 14 of these patients."† In 49 cases, which I have observed myself, and in which I have specially noted the point, I find 7 cases of an apparent hereditary predisposition to cancer. [Five cases of scirrhus of the breast, one of encephaloid of the soft palate, and one of osteoid cancer of the femur; in all of which seven cases the patients knew of a blood-relation having died of cancer.]

Summing up these cases, we have in 151 cases 21 cases of inherited (?) tendency to cancerous disease: about one-seventh of the total number of cases, or about 14 per cent. This proportion is too small to establish the hereditary nature of cancer; but even this state-

* *Traité des Maladies Cancéreuses.* Paris, 1833.

† Lebert's "*Maladies Cancéreuses*," p. 134. Mr. Paget's statistics I have been obliged to reject, as they include cases of epithelioma—which I do not recognise as cancer.

ment must be taken *cum grano salis*; for a reason, which Louis advances in his *Recherches sur la Phthisie*, viz., that the bare statement of a patient that one of his relatives died of cancer is not sufficient evidence to the pathologist that such was really the case; he must endeavour to elicit the main features of the disease, and then judge for himself, whether the patient's statement and his own opinion are in sufficient unison to warrant a positive conclusion. Louis, in this way, found, even in the case of phthisis, that, "of 31 phthisical patients, only 3 sprang from parents who were obviously phthisical, 12 from parents who were not phthisical, and 16 from parents the nature of whose disease could not be determined with precision." Now, if Louis considered such precautions necessary to elicit the hereditary character of phthisis, *à fortiori* should they be observed in a disease the hereditary predisposition to which is yet *sub judice*. We may very well conclude that all the above numbers in the case of cancer are, in this point of view, open to objections. I have hence attempted to solve the problem by a totally different method.

Let us assume, in the first instance, that phthisis may be safely taken to be the type of an hereditary disease, then, from the fact that phthisis and cancer are both *fatal* diseases, we have the means of instituting the following comparisons, which are best exhibited in a tabular form.

COMPARATIVE MORTALITY OF CANCER AND PHTHISIS IN LONDON IN THE YEARS 1845-1850.

Year.	Deaths from Cancer from the age of 25 to 80.			Deaths from Phthisis from the age of 5 to 65.		
	Males.	Females.		Males.	Females.	
1845	160	519	...	3,233	2,762	...
1846	174	626	...	3,441	2,862	...
1847	177	574	...	3,497	2,923	...
	(from ages of 20-80.)					
1848	204	640	...	3,266	2,739	...
	(from ages of 20-80.)					
1849	195	645	...	3,045	2,740	...
1850	208	656	...	3,049	2,683	...
Sum	1,118	3,660		19,531	16,709	
Total	4,778			36,240		

Hence the average annual mortality in London from cancer in both sexes, from the age of 25 to 80, and from phthisis from the age of 5 to 65, is respectively 796.5 and 6040; and the ratio of the average mortality of cancer to phthisis is 1-7.5.* Now, I contend that, if cancer is less than one-seventh as fatal as phthisis,† this fact alone is sufficient to render it highly probable that *cancer, as a rule, is not an hereditary disease.*

Any objections to this conclusion, founded on the disparity of frequency of the two diseases, are met by

* The deaths in London have been taken as the basis of calculation, because from the large proportion of deaths that occur in public institutions the diagnoses can be better relied on. Deaths from "phthisis" before the age of five have been excluded on account of the doubtful nature of the diagnosis. It is satisfactory, however, to find that deaths at all ages from the two diseases being taken as the data, nearly the same result is arrived at, viz., 1-7.9.

† It is not unworthy of remark, that this ratio is also nearly that which the number of hereditary cases of cancer bears to the total number of cases of cancer, in which this particular has been inquired into.

the probability that, if cancer, *ab origine*, was a much rarer disease than phthisis, but that both had propagated themselves by hereditary transmission, after the lapse of so many centuries their numerical ratios would by this time have equalised themselves to a greater degree, than is the fact.

That an hereditary taint *does* sometimes exist cannot possibly be denied; but that carcinoma is hereditary in the sense that tuberculosis is, is equally devoid of truth. On the whole, I am inclined to regard this particular in the ætiology of cancer as of little or no value in a diagnostic point of view. The popular idea is, as medical practitioners must be well aware, that hereditary predisposition exercises an unusually baneful influence in the production of cancer.

From the bills of mortality in England and Wales for 1837, 1838, and 1839, Walshe infers women are cut off by cancer, to what men are, in the ratio of $2\frac{3}{4}$ to 1; but, on referring to a table he gives of the returns of the Parisian registers, it will be found that out of 8,289 cases in which the organ affected is specified no less than 3,440 cases belong to the uterus and female breast. From this we must conclude that the great preponderance of deaths from cancer in the female sex arises. Lebert's inferences are to precisely the same effect. Hence, however significant the influence of *sex* may be in the natural history of cancer, its diagnostic value becomes entirely lost. No inference, indeed, at all can be drawn from the above premiss. It is only a knowledge of the comparative frequency of *other* tumors in the breast and uterus, that any conclusion

can be arrived at; but this involves quite another question, viz., in how far the *locality* of a tumor should affect our judgment of its nature? This we will discuss further on.

Age, on the other hand, forms a very important item in the diagnostic elements of cancer. For its due appreciation however the point last alluded to must be taken in conjunction, namely, the *locality* of the tumor. Lebert and Paget advert to the preference carcinoma has to affect certain organs at certain ages; but the great increase of diagnostic value that these two elements derive from their associated consideration over what they possess when only considered separately and independently, although doubtlessly felt by practitioners, does not appear to have been insisted on sufficiently by systematic writers on the subject. A good illustration of this position may be derived from tumors of the female breast. Supposing we are told that a female has a *tumor in the breast*, and nothing more: from this we can infer nothing. Supposing, again, we are told a female with a tumor *somewhere* is aged fourteen: from this we can infer nothing. But let us be told that that "somewhere" is in the *breast*, and we at once, *cæteris paribus*, derive a most important conclusion: viz., that the chances of the tumor being of a cancerous nature are infinitely small.

Tumors of the breast possessing such a weighty interest with the practical surgeon, I may perhaps be allowed to give some of Velpeau's statistics on the point.

Before doing so I may be allowed to direct

attention to an error which has been constantly committed (and which I committed myself in the first edition of the present work). Statistical tables on the ages of patients affected with any particular disease, have almost invariably been formed from the ages patients stated they were, *when they first came under the surgeon's observation*. Now this age is clearly a mere accidental circumstance, of no value or interest to the pathologist. What we really want to ascertain is, the age at which cancer or any other disease first *develops* itself. The following tables have accordingly been constructed from the corrected ages—*i. e.*, the age given in Velpeau's tables, *minus* the previous duration of the disease:—

SCIRRHUS OF THE BREAST.	
AGE—YEARS.	CASES.
17	2
20 to 30 (inclusive)	5
30 to 40 „	21
40 to 50 „	32
50 to 60 „	15
60 to 70 „	5
70 to 80 „	2
	82
	82

ENCEPHALOID OF THE BREAST.	
AGE—YEARS.	CASES.
20 to 30 (inclusive)	3
30 to 40 „	4
40 to 50 „	7
50 to 60 „	9
60 to 70 „	2
70 to 80 „	1
	26
	26

So that the female breast is most liable to scirrhus between the ages of 30 and 60, to encephaloid between the ages of 40 and 60. This is remarkable in the encephaloid form of the disease, which in other situations is certainly more the cancer of early life. The greater frequency of scirrhus than of encephaloid in the breast is another of the results of the above tables. Within the last seven years I have seen a great many cases of scirrhus, but only six of encephaloid in this organ.

On the other hand, a comparison of Velpeau's table of "adenoid" tumors of the breast exhibits the following statistics:—

ADENOID OF THE BREAST.	
AGE—YEARS.	CASES.
8	1
10 to 20 (inclusive)	6
20 to 30 "	14
30 to 40 "	9
40 to 50 "	9
50 to 60 "	1
70	1
	41

So that the greater number of cases occurred between the ages of 20 and 50. Nevertheless, if a patient were to come to us with a tumor of the breast, whose age lay between 30 and 50, the probable cancerous nature of that tumor is the necessary inference from the considerations of age and locality. That this must be so could not be inferred from the facts furnished by the above tables alone, but from the third fact, that of the

two sets of tumors, cancerous and adenoid, the former is by far the more common. During the years 1836 to 1852 Velpeau met with 136 cases of scirrhous and 53 cases of encephaloid of the breast, making together 189 cases of malignant tumors in that organ; whereas during the same years he only had 52 cases of adenoid tumors.

In the same way a solid tumor of the eye or orbit in a child under twelve is always to be looked on with suspicion; it is probably encephaloid. A tumor in the same situation in a subject past the meridian of life is probably melanotic. The perusal of a number of cases of melanotic cancer of the eye discloses a remarkable difference in the age of patients the subject of this special disease to those the subject of ordinary fungus hæmatodes of that organ. The age of a patient referred to at page 4 I saw afflicted with this disease was fifty-three—beyond the prime of life, though not what would be called an advanced age; that of a second, referred to at page 7, was thirty-five, and in this respect the cases agreed with all the reported cases I have met with. Mr. Lawrence in a Clinical Lecture on the Organic Diseases of the Eyeball in the *Medical Gazette* for 1847 states the earliest age he has ever observed was twenty-two; in his Work on the Eye he says the most usual time for its occurrence is at and after the middle period of life. Now in simple fungus hæmatodes of the eye, without any melanotic discoloration, the very reverse holds good. Of twenty-four cases Mr. Wardrop knew of, twenty were under twelve years of age. Desault's experience was the same. "Plus du tiers des malades

qu'y (à l'Hôtel-Dieu) a opérés Desault etaient au-dessous de douze ans." In a fatal case I witnessed at the Middlesex Hospital the germs of the disease were perceived when the child was but six months old. On the other hand, if the patient's age is—say somewhere between 12 and 25, our diagnosis derived from this consideration is less gloomy.

The following very important case, that occurred in my practice at the South London Ophthalmic Hospital, formed an exception to the rule.

CASE 20.—*Encysted encephaloid of the orbit, producing protrusion of the eyeball and loss of vision: Operation: Restoration of the situation, and gradually of the functions of the eyeball.*

Elizabeth P., æt. 28, was admitted into the South London Ophthalmic Hospital under my care, January 4th, 1858. She had noticed the right eyeball protruding from its socket for upwards of a twelvemonth. It was also displaced downwards, and its mobility somewhat impaired. The eyeball itself did not appear enlarged. Mr. Wharton Jones and myself examined its interior with the ophthalmoscope, but detected nothing but a congested state of the retinal vessels. Under the expanded eyelid was felt outside a small, smooth, apparently lobulated tumor, about the size of a bean. She had no tumors on any other part of the body. For the last six weeks her sight had been gradually getting dim: when she came to me she could not distinguish persons' faces with that eye, and printed paper appeared to her as blank. She had never had double vision or ocular spectra.

By a transverse incision in the upper eyelid I came down to the tumor felt before the operation and removed this, but soon found that *it* formed but an insignificant part of a large growth that occupied the outer side of the orbit and reached to the very bottom of that cavity. I removed it partly with the knife, partly with my left index finger. The blood welled up very profusely from the gap in the

orbit, but was arrested almost immediately by cold water. I did not place any lint in the wound, but simply covered the whole with a piece of wet lint.

The tumor weighed upwards of half an ounce, was lobulated in its surface, and enclosed in a firm cyst of cellular tissue. Its section was that of an ordinary encephaloid tumor, without the slightest tinge of any pigmentary discoloration: its microscopic characters were unequivocally cancerous.

By a couple of days the wound in the eyelid had healed by the first intention, the eyeball regained its place and the patient recovered a good deal of vision: she can now distinguish persons' features and large letters with this eye.

These examples will be sufficient to illustrate the above position. However interesting Dr. Walshe's result may be—that "the mortality of cancer goes on steadily increasing with each succeeding decade," it helps us but little in our diagnosis: cancer may and does occur at almost any age. I have met with a great variety of ages (6 months, 6 years, 14, 15, 21, 23, 28, 37, 40, 42, 53, 59, 64, 67, 72 years, and two of 77 years, are among some of the various ages I have noted).

The *previous health* of the patient gives us but little information. As a rule it will be found that cancerous patients have been otherwise remarkably free from disease.* The most notable fact under this head is the undoubted antagonistic influence of carcinoma and tuberculosis on each other. Of one fact we may feel certain, that the two deposits are rarely found together in post-mortem examinations, and that to obtain evidence that they were deposited concurrently, is a matter of

* In thirty cases of scirrhus and encephaloid in which I have noted the previous health, in twenty-two it has been unimpeachable; and in the remaining eight, any previous illness the patients may have had has been but of a transitory nature.

still greater rarity. Such evidence was obtained in the following case, for which I am indebted to Mr. Sibley.

CASE 21.—A woman had had an increasing scirrhus of the breast for six years, by which time it had attained the size of two large oranges. A fortnight before she entered the Middlesex Hospital ulceration and sloughing of the growth had commenced and by the time of her admission half the growth had been thus destroyed; in the course of five days longer the work of destruction was completed and all that remained of the original tumor were some hard nodulations surrounding a healthy ulcer, which soon after cicatrised nearly in its whole extent. Now soon afterwards two events occurred simultaneously and proceeded concurrently:—1, A new tumor developed itself below the scar; 2, Bronchitis and pleurisy set in. For about six weeks both the tumor and the chest affection were on the increase; for about the same length of time (up to the patient's death) the tumor diminished, but the pectoral symptoms still increased. At the autopsy tubercles and cavities were found in both apices of the lungs and beneath both pleuræ numerous crude tubercles and tolerably recent adhesions were found. The cancerous nature of the tumor was likewise substantiated. The preparations of this case are to be seen in the Pathological Museum of the Middlesex Hospital.

The same concurrence of diseases most probably took place in the following case, remarkable also for its clinical course and form the tuberculosis took.

CASE 22.—*Acute Encephaloid of the Breast: Operation: Recurrence in situ with Tuberculosis of the Thoracic and Abdominal Lymphatic Glands.*

Esther B., æt 28, having been violently engaged at some laborious occupation, discovered, two months afterwards, a hard lump the size of a walnut in her left breast. In another three weeks a tumor with a highly inflamed summit presented itself above the nipple and was

opened by a surgeon; but nothing but blood came out. After this the breast swelled greatly and a fetid sero-sanguinolent discharge poured from the wound; severe lancinating pains ensued, the pulse rose to 130, her appetite failed her and her rest became broken. She was then admitted into the Westminster Hospital under Mr. Holt. A scalpel was passed deeply down "to the ribs" in the situation of the previous superficial wound, and "a considerable quantity of stinking, broken-down pus" was discharged. The wound at first appeared as, if it were about to granulate up; but the granulations soon became fungous. When I first saw her myself, she appeared ill and worn out. Above the left nipple was a large sloughing fungus, 6 inches broad by 4 inches long; the upper part of the growth was free from slough and had an angry red appearance. The glands in the axilla could not be felt to be enlarged, but one of the cervical glands was so. On the same day that I saw her the upper half of the breast together with the fungus was removed. The tumor was so soft, that during its removal a part broke off; the hæmorrhage was very profuse. On section the growth was seen to be one of encephaloid cancer: its color was greyish white and hæmorrhagic; abundant pin-head drops of a turbid white fluid distilled from the surface on pressure. It was composed nearly entirely of cancer-nuclei: it contained also some polynucleated cancer-cells, which were, as was the whole growth, largely pervaded with fine oil globules. No fibrous or fibro-plastic elements were observed.

The tumor soon returned and the patient died three months after the operation.

POST-MORTEM EXAMINATION: The subcutaneous fat was abundant. The trunk and lower extremities were anasarcaous.

THORAX: The entire left side of the front of the chest was occupied by a large sloughing fungus; a thin stratum of pale muscular fibres being all that remained of the great pectoral muscle. On opening the chest the parietal pleura was found entire, but would very soon have become perforated by the fungus, had the patient lived longer.

Lungs: Congested and œdematous, but containing not a single morbid deposit. Old pleuritic adhesions on the left side; a large

quantity of limpid serum in the right pleural cavity. The bronchial glands at the bifurcation of the windpipe were greatly enlarged by crude yellow tubercle, partially stained by carbonaceous deposit.

Heart and Great Vessels : Healthy.

ABDOMEN : The abdominal walls, the omentum and mesentery were remarkably loaded with fat.

Liver : Its texture fine and compact ; portal congestion ; no morbid deposits.

Pancreas : Healthy.

Spleen : Healthy.

All the lumbar glands, greatly enlarged, were found converted into masses of crude yellow tubercle : one knobby mass near the head of the pancreas was the size of a child's fist. The chain of tuberculous tumors extended down the course of the external iliac vessels to the abdominal rings ; indeed, these, the aorta and vena cava were completely embedded in the tubercular deposits.

On cutting into the encephaloid fungus from the breast, it was seen to be a white, soft, creamy mass, studded over with innumerable patches of very fine capillaries, which, of a claret color at first, soon assumed a crimson tint after a little exposure to the air. In a word, the tissue of the fungus was evidently highly *inflamed*. Some of the deeper portions were firmer in texture and allowed of a distinction being observed between a very spare, opalescent matrix and an opaque-white, streaky tissue. I macerated a portion of this tumor and then subjected it to the continuous action of a stream of water. The result was a dense sponge-work of trabeculæ—the stroma of the growth—the ends of which, floating out in water, conferred upon it an appearance similar to that of the chorion. I found this stroma consisted of waved cellular tissue and capillaries. Several encephaloid tumors, which I have subjected to this same process, have yielded the same results. The microscopic characters of this fungus resembled closely those observed before in the original tumor.

The yellow tubercle was enclosed in thin, but strong, cellular pseudo-cysts, out of which it could be shelled out in buff-colored, friable, unctuous masses ; which consisted of innumerable, rounded, finely punctuated corpuscles ("tubercle-corpuscles") and multitudes of fine oil globules.

Hannover states that in 338 *post mortem* examinations in the Friedrich's Hospital in Copenhagen cancer was found combined with tubercle only three times. In 104 necropsies of cancer Walshe observed only seven instances of tubercle. Paget gives a well-marked case. Lebert relates an interesting illustration. A woman, aged 62 years, died with all the symptoms of advanced phthisis. At the autopsy crude and softened tubercles and vomicæ were found in the apices of the lungs; the peritoneum contained many partly cancerous, partly tuberculous infiltrations. The liver also contained cancerous masses, mingled with deposits of tubercle. Dr. Carl Martius of Erlangen has accurately recorded twelve necropsies of tuberculosis of the lungs combined with cancer in other organs of the body.* Up to the time of publication of the first edition of this essay I had observed two cases of the coexistence of cancer and tubercle; neither of these cases were, however, very satisfactory ones; one was carcinoma of the right auricle of the heart—a dissection-room case; the second a case of colloid (on the nature of which disease opinions are still divided) of the peritoneum. In both of these genuine crude tubercles were found in the lungs. But I am now able to produce, in addition to the case of Esther B., the following one:—

CASE 23.—*Encephaloid of the Antrum: Tubercles in the Lungs.*

Obid O., aged 77, consulted me in September 1854, for a swelling of his right cheek, that had existed about four months before I saw

* Die Combinationsverhältnisse des Krebses und der Tuberculose, von Dr. Carl Martius. Erlangen: 1853.

him. The right malar region was considerably swollen, felt doughy, was dingy red and glossy; it was very tender and he experienced remitting pains in the part of a pricking and shooting character. He had five decayed teeth in front of the upper jaw and had lost all his other teeth long before. The vision of the right eye was unimpaired. In his right nostril was an ordinary mucous polypus, which had existed for some years; this I removed. He knew not how to account for his malady. None of his relations ever had cancer, but there appeared to be a tuberculous tendency in the family. He had lost flesh; his appetite had forsaken him; his complexion was dull and earthy.

The further progress of the case may be told in a few words. The tumor increased, but never reached any considerable size, nor gave him much pain. The right eye was attacked by a chronic inflammation and was slightly protruded; and he at last became nearly blind of this eye. He lost his sense of taste; "everything tasted alike to him." The nostril bled occasionally, often to a degree sufficient to require medical attention. His sense of smell too became impaired. But it was in his general health that the most marked changes occurred. He wasted to a "living skeleton," sinking with it to a degree of debility not often witnessed. He died the latter end of February 1855, about eight months from the first commencement of his disease.

POST-MORTEM EXAMINATION. *Brain*.—Normal. *Antrum*.—Filled with a growth which reached to the very bottom of that cavity and had completely destroyed its anterior wall and the floor of the orbit. The tumor was of the medullary species; the cut surface was firm, yellowish white, not hæmorrhagic. On pressing it, a good deal of thick, white, turbid juice, exuded in small drops. I found this growth composed exclusively of cancer-cells—without exception, the most perfect specimens I have ever seen. Some were circular; others lengthened out; others again of an extreme length and narrowed. A great many contained two or more, often a large number, of nucleolated nuclei—excellent examples of endogenous cell-formation. Exudation corpuscles and fat globules were also abundant. *Lungs*: Upper halves of both firmly consolidated by quantities of crude yellowish grey tubercles. A few small vomicæ. No cancerous

deposits. The microscopic characters of the tuberculous matter were well marked. *Heart*: Some indurations at the edge of the mitral valve and in the line of attachment of one of the segments of the aortic valve. Bicuspid and pulmonary valves normal. No hypertrophy or dilatation; muscular substance firm. *Liver*: Portal system congested. Contained a small earthy nodule. *Kidneys*: Left one of a deep venous hue, with a small cyst in its substance. Right one healthy. *Spleen*: Normal. *Intestines*: Not opened; much narrowed in calibre.

Another fact worthy of attention is the different susceptibilities different organs have for the development of the two morbid states. Thus original cancer of the lungs is very rare, original tuberculosis of the lungs very common; original cancer of the liver is not uncommon, original tuberculosis of the liver is rare. And these facts may be multiplied for several other organs.

I have long been struck, when listening to the melancholy tales of cancerous patients, how often one hears that some of their relatives have died of consumption. Is there any connexion between the two diseases? Are they in any way, as it were, *vicarious* to one another? If they were, the great rarity of their both occurring *together* would be at once explained. However, the materials for answering these questions are as yet too scanty and vague to allow of any positive conclusions. All I will say is, that of 40 patients, the subject of scirrhus or encephaloid, 15 knew of one or more blood-relations having died of phthisis.

I all but pass over the *exciting* causes (?) of cancerous tumors: their influence is, in our present state of knowledge, much too equivocally established, even generally, much less specifically, to avail us in forming an opinion.

It is but fair to state however, that many excellent surgeons have held with the exciting causes of tumors. Thus, Mr. Liston thought many tumors of the jaw had their origin in bad teeth. Mr. Stanley, in his classical work on the Bones, expresses a like opinion. Mr. Cæsar Hawkins does not think so; in a case of vascular epulis that fell under my observation no such caries existed; and if we consider the vast disproportion between the number of persons with decayed teeth and those that labour under tumors of the jaw, I think we cannot help repudiating any such relation as cause and effect between the two affections. A parallel case is that of corneitis and granular eyelids; both are sometimes coincident, yet the latter are infinitely more common than the former.

Some most weighty deductions may be drawn from the "special previous history."

We shall first consider the question of the *progress of growth*. There can be no doubt that, *cæteris paribus*, the shorter the time a tumor has taken to attain a given size, the greater the suspicion of malignancy that attaches itself to it. But still we are inclined to believe that sometimes too much stress has been laid on this point, and that it has often so pre-occupied the judgment of the surgeon to the exclusion of the other facts of the case, as to have led him astray. A case occurred to Mr. Lawrence, where a tumor of the right upper jaw, clinically and anatomically innocent, recurred, and was removed successively four times in the course of fourteen months. After the fourth operation it grew again, and at the same time some new growths made

their appearance—one on the *left* upper jaw, and two on the cranium. It was removed for the fifth time, when, strange to say, the three others disappeared spontaneously. A familiar instance of the rapidity of growth of some benign tumors is furnished by the *nævi* of young children. That on the other hand malignant species not uncommonly run a very chronic course, is sufficiently attested by our daily experience, especially in the harder forms of the disease. The following is an extreme case of the kind:

CASE 24.—Sarah A., aged 55, has been six years in the Cancer Wards of the Middlesex Hospital. It is now 20 years since she first perceived a tumor, the size of a small nut, in her right breast. After a year's growth this was removed by a surgeon. It recurred a year after the operation, and is now in the condition of an open cancerous ulcer. In the *left* breast is also a small ulcer, and the surrounding parts are a good deal seamed, contracted, and nodulated. The exciting cause of this latter development was an attack of *erisypelas* of the chest three years ago; three months after which attack tumors formed under the left arm. She has not lost flesh for these last 16 or 17 years. A paternal cousin died of cancer of the breast.

I, on the other hand, saw in consultation with my friend, Dr. Grasmann, a lady who had a scirrhus tumor of the breast (with an enlarged gland in the axilla), which had attained a size of 4 in. by 3 in. in apparently less than two months. I subsequently saw two other cases in the Middlesex Hospital, under Mr. De Morgan, where scirrhus tumors of the breast had attained enormous sizes in a comparatively short time. It is as well to be aware of these cases of "acute" scirrhus, as they are otherwise very liable to be confounded with encephaloid tumors.

Wardrop, speaking of fungus hæmatodes of the extremities, says, "the progress of this species of tumors is slow." Modern surgeons would however feel little disposed to coincide with such a general statement as this.

Loss of flesh without obvious cause (as derangement of the digestive organs, copious fluxes, etc.), may be taken as an ominous ill-boding symptom indicative of some organic affection—most commonly of a tuberculous or carcinomatous nature—taken in connexion with the existence of a palpable tumor pointing to this being of the latter description. Yet every one knows that this symptom is not unfrequently wanting, that in the early stages of their disease patients often preserve their embonpoint in all its integrity. This is occasionally seen even after death from malignant disease. The case of encephaloid of the breast, narrated at page 57, is a remarkable illustration of this fact. The symptom we have been just speaking of, together with exhausting sweats, derangement of the digestive organs, and a peculiar waxy tint of the countenance, form together the principal elements of the so-called "cancerous cachexia." Very different opinions as to the *specific* character of this symptom have from time to time been advanced. The *aspect* of the patient can be the only point at issue: the other manifestations of the cachexia are common to it and several other hectic conditions. I hardly think that any one who has paid any attention to the physiognomy of disease can fail to have observed every now and then

something peculiar in the faces of these unfortunate patients, that, as his field of observation widens, he finds these self-same faces every now and then repeated again and again, in a modified perhaps, but still sufficiently appreciable form. At what *stage* of the disease this cachexia sets in, is another question; too late generally to be of any diagnostic value, the nature of the affection having already declared itself in too decided a manner to need any corroboration from that source. Velpeau's words are to this same effect, that the cancerous cachexia is as a rule only to be found after the general infection of the economy has established itself. An observation in the same direction is, that in no class of cases is the cancerous cachexia more distinctly observed than in those acute cases of cancer, in which several tumors succeed one another with great rapidity in different parts of the body. Authors, it would appear, have in their discussions not sufficiently separated the two questions—the *existence* of a cachexia generally, and the *time* at which that cachexia first makes its appearance. Those who would make us believe that in the early stages there is invariably something "cancerous" in the look of the patient, sufficient to be of high diagnostic value, appear to err as much as those who deny any such appearance *in toto*. It is true that every now and then we *do* meet with the cachexia at a stage where it receives no sufficient explanation from the local symptoms (I can recall a few cases to my memory), but this must certainly be regarded as exceptional: indeed, many patients wear an air of health and

vigour little consistent with the fatal character of their malady.*

The next set of facts we have to consider, are those appertaining to the tumor itself, which has induced the patient to seek our aid. In doing this, we will direct our attention to the two most frequent forms of malignant disease—Scirrhus and Encephaloid. (Melanotic, Villous, and Osteoid Cancer have been already spoken of at pages 3, 10, and 13: Colloid Cancer will be treated of at Chapter IV.)

SCIRRHOUS tumors of the breast, forming, as they do, a large share of the cases of surgical cancer met with in practice, may be taken as the type of their species. One of the most striking characters of such tumors is their excessive hardness; it is what may be termed a *dead*, or as it is often spoken of, a “stony” hardness (“Stony Cancer”), devoid equally of the doughy feel of a fatty growth and the elasticity of a medullary one. A nodulated, tuberculated surface is often alluded to. “This inequality may be considered as characteristic of the disease.” (Abernethy). This appears, however, not to have much distinctive value; it is felt in chronic mammary tumors of the breast; indeed Lebert, who has devoted a special chapter to their consideration, under the title of “Partial Hypertrophy of the

* This is a most important point to be aware of in practice generally. I saw a boy from the country who had a vast encysted tumor. He was apparently in the most robust health; he was operated on; he died two days after the operation; the autopsy shewed he had Bright's disease. This is one of those practical lessons not easily forgotten—never to operate on any patient without previously subjecting him to the sort of examination a conscientious physician would institute at an assurance-office to feel confident of the absence of all organic disease.

Gland," directs attention to their "*surface grenue comme nodulée*," comparing it to the sensation felt in handling a packet of rice. Besides, everyone knows the healthy gland itself has a well-marked nodulated, or rather irregular "corded" feel, if we may be allowed the expression, approaching that of the knotted veins of a varicocele saving the mobility of these latter. The comparative fixedness and intimate connection, amounting, so to say, almost to an incorporation with the gland, contrast strongly with the total independence with which the glandular tumors roll under the fingers—foreign bodies, with but loose attachments to the adjacent tissues.

Retraction of the nipple, dimpling and discolouration of the skin, and enlargement of the superficial veins, are bad signs.* On the other hand, I some years ago saw a young lady from whom Mr. Quain removed a chronic mammary tumor, which, although it had attained a considerable size and lasted many years, had induced none of these untoward appearances. Striking and easy of appreciation as these differential signs may appear, every one knows what difficulties of diagnosis many of these cases present even to the most practised hand. The co-existence of cystic formations is especially liable to mislead. Such a case was under

* This latter circumstance is often dwelt on by some surgeons as indicative to a certain extent of the malignant nature of a tumor. It happens, however, in most tumors that have made any progress, and is in all probability caused by their pressure on the deeper veins, the circulation being thus thrown to an exaggerated degree on the superficial ones which are not subjected to this pressure. "Perhaps the weight of the tumor compresses the deeper seated veins, and obliges the blood to return in larger quantities through those nearer the surface."—"Surgical Observations on Tumors," by John Abernethy. Lond., 1827.

Mr. Erichsen about four years ago. The diagnosis, before the operation, was cystic sarcoma; the anatomical and microscopic characters were especially distinctive—those of scirrhus. The error might possibly have been guarded against, as the clinical history and a glandular enlargement in the arm-pit were suspicious. However, the practice must have been the same in either case.

ENCEPHALOID growths present very different, but in typical cases, equally distinctive marks by which they may be recognised. The following description, *ad naturam*, taken of a well-marked case of fungus hæmatodes of the humerus may be taken as highly illustrative. “The upper half of the right arm is swollen out into a tumor that has well-defined limits in its whole extent; it has an elastic resilient feel in the greater part of its extent, sinking beneath the finger on the application of pressure, but returning immediately to its former level on removing the finger without the slightest pitting being induced. At places some harder and more resisting points are to be felt. The skin has a faint dusky blush and some of its superficial veins, especially anteriorly and internally, are dilated; the skin moves much less easily over the tumor, than it does over the muscles in the lower half of the arm. It has been punctured several times, but nothing but blood exuded.” This will be sufficient to serve as a basis for a few remarks on the physical signs of these growths.

No sign is more important to be fully conscious of than the “elastic feel” mentioned *suprà*. It in many cases gives rise to a degree of fluctuation that the most

refined *tactus eruditus* is incapable of distinguishing from that of fluid fluctuation, and this is more particularly the case after the mass has undergone a degree of softening. Wardrop states that in four cases of malignant sarcocele which fell under his notice the tumor was punctured for hydrocele, and Velpeau does not know how many times he has not seen soft encephaloid taken for abscess. However in some instances encephaloid tumors may contain large collections of fluid—the result of softening of the cancerous mass, extravasations of blood, suppurations, &c. Some years ago a man died in University College Hospital, who for a lengthened period had all the signs of ascites: it was found at the autopsy that an encephaloid tumor had developed itself in the omentum and then softened down into a vast pseudo-cyst containing twelve pints of a bloody grumous fluid. This is a less dangerous error than its reverse—that of taking an abscess for a tumor. This mistake however has happened to the best surgeons of the day. Roux, Sir Astley Cooper, Liston, have all done it, and I have myself seen a breast amputated for a supposed tumor, which turned out after the operation to be only a small chronic abscess.* Such facts as these prove the necessity of never omitting an exploratory puncture in any case that may offer a shadow of a doubt, should it be thought expedient to remove the suspected growth. Indeed, we do not

* For obvious reasons I refrain giving the case in detail, but I may perhaps mention, that curiously enough this patient's mother died of cancer of the breast—a circumstance which contributed in no small degree to the formation of a faulty diagnosis, still further strengthened by a most deceptive history.

see why, in the same way, as it has become a fundamental maxim in surgery not to operate for stone without being able to "sound" it immediately before the operation, why, excepting perhaps in the most palpable cases, the same rule should not be established with reference to tumors—to use the grooved needle before the knife. It can do no harm; it may save the patient that which no art can restore. In adopting such a rule it would be as well not to limit oneself to a single puncture, as occasionally these growths are the seats of limited suppurations in their substance. However, negative results admit of but one interpretation. But even *hard* tumors may prove to be really nothing more than chronic induration around an abscess. The subject is of such paramount importance that a case at point may not be deemed misplaced.

CASE 25.—James H., aged 38, was admitted, under Mr. Erichsen, into University College Hospital for a tumor under the jaw. He first noticed it three months before admission; within the last month its growth had been very rapid. It had occasionally felt as if pins and needles were pricking it, otherwise he had experienced but little pain. The submaxillary region below the symphysis was projected into a tumor which measured three inches across, the lateral and inferior limits of which were well defined, but the superior one not so well, the growth appearing to rise up under cover of the jaw. It had a hard feel, and moved pretty freely on the subjacent parts. There were no glandular enlargements whatever in its vicinity. All who saw the patient thought they had a case of epithelioma before them. The age of the patient, the rapidity of the growth (in this point of view the case offered a striking proof of some observations made at page 63 on this particular), the character of the pains, were, indeed, all favourable to such a notion. However, no one would think of removing a

growth like the above in this neighbourhood (which on account of the numerous glands, salivary and lymphatic, which are situate here, must always be looked on as a doubtful region) without an exploratory puncture. Accordingly Mr. Erichsen felt for a fluctuating point and found it: a grooved needle was introduced, some pus escaped. The "tumor" was an abscess! In a short time the man left the hospital cured of his "lump."

If there be any doubt as to the nature of a growth while the skin or mucous membrane over it are still intact, this doubt is generally in a great measure dispersed after it has fairly broken through these coverings. We may then have presented to us two appearances: a surface more or less approaching an ordinary ulcer in its characters; but generally distinguished by its hard, jagged, everted edges, a deficiency in granulating power, a thin offensive discharge, and a tendency to sloughing and bleeding. Or the cancerous granulations sprout out in the form of *fungi*, the nature of which will become apparent from some of the following descriptions. I have, I think, been able to discriminate two principal types of malignant fungi, presenting well-marked differences in aspect, and depending on, or rather coïtaneous with, the circumstance whether the fungus protrude through ulcerated skin or ulcerated mucous membrane. Of the first variety the following case affords a good illustration:

Wm. H., aged 77, was admitted into University College Hospital, under Mr. Erichsen, for a malignant ulcer of the leg. "On the outer aspect of the lower third of the right leg is a projecting mass of rounded fungoid growths; some are of a greenish brown, some of

an almost black, sloughy aspect, while a few at the circumference have a dusky red, more inflammatory, appearance. To the touch they are hard, yet elastic: they yield a thin, highly offensive discharge. The surrounding skin is red and strongly everted." Amputation was performed below the knee. A section of the growth displayed all the usual characters of scirrhus, and cells of indubitable malignant forms.

The form noticed in the above case is frequently seen in ulcerated scirrhus of the breast, in which another form occurs, characterised by a smooth surface totally devoid of all granulations and a peculiar radiated, veined, purple hue.

The next two cases may be taken as representatives of the second form.

Susannah G., æt. 15, was admitted under Mr. Quain into University College Hospital, for a malignant growth in the right antrum. A portion of the tumor had broken through the mucous membrane of the hard palate, and, projecting into the mouth, offered the following characters:—It was "of a dusky purplish aspect, here and there yellowish and sloughy in look, with an imperfectly granulated surface, elastic and semi-fluctuating to the touch, with a thin serous discharge, and considerable fœtor." After death, the growth was found to be of the soft encephaloid variety.

George C., æt. 53, was admitted into University College Hospital for cancer of the cheek. "On looking into the patient's mouth, an oblong growth is seen projecting from the inner surface of the cheek into that cavity. It is of a lobulated, light red, here and there sloughy,

appearance, and discharges a thin, very bad smelling purulent fluid." Before the patient's death the growth had made its way in the opposite direction, through the skin of the cheek, in the form of some red, dry, fungoid masses, quite unlike the internal fungus, and agreeing essentially with the first form of fungus alluded to above. The autopsy showed this to be a case of ordinary scirrhus.

To sum up: the first variety of fungus is distinguished from the second by the much larger size of its rounded fungosities, their brighter, less purplish tint (except where a sloughing action has been going on, as in the case of Wm. H.), drier look, and their firmer consistence. The case of George C. is interesting as illustrative of two points: 1. That these differences do not depend on the scirrhus or encephaloid nature of the fungus. 2. Of the co-existence of the two forms with perfectly separate characters in the two situations in the same subject. It will be observed that the examples of the second form both occurred in the mouth; the following example of malignant fungus in the nose inclines me to suppose, that the differences of aspect depend somehow on the secretions in which the fungus is bathed, seeing that here, where the secretions are less abundant and constant, the characters of the growth were in a measure intermediate.

Elizabeth R., æt. 69, was admitted into University College Hospital, under Mr. Quain, for a malignant polypus of the nose. "On looking up the right nostril, this is seen filled by a fungus, the lower end of which offers the following characters. It has a some-

what lobed, not in the slightest degree granulated, surface, which is at parts dry and covered with a scab of concremented blood; at parts moist with its discharge, pale and smooth. Felt through the medium of the nasal wall, it feels hard in some places, soft in others."

Without wishing to insist too strongly on any sharply defined differences, which the above cases may point to, I think the distinctions drawn will in the main be found not to be far from the truth.

One of the most remarkable characters of malignant growths is their great tendency to take on a *sloughing* action when they have reached the ulcerative stage. This fact had already attracted the attention of the older writers. Wardrop, in speaking of fungus hæmatodes of the extremities, states that "when the fungus has increased to a large size, the most prominent parts begin to lose their life and slough away." Cruveilhier says: "La gangrène entre en quelque sorte comme un élément nécessaire dans ce genre de maladies." The father of a child who was in the Middlesex Hospital for fungus hæmatodes of the eye, declared to me that he believed the tumor "would have been almost as large as the child's head but for the pieces of yellow and black scabs, as large as walnuts, that fell off from time to time."

In certain exceptional cases nearly the whole morbid deposit may slough off in this way. Sir Everard Home relates such a case at page 34 of his tract, "On the Formation of Tumors." In still more exceptional cases an apparently healthy granulating surface may be felt, which may then cicatrise over. Such a case is referred

to at page 57. Richerand relates a remarkable instance : *
“ A woman of about forty-eight years of age entered the Hospital of St. Louis with a cancerous engorgement of the right breast. The very hard mass softened ; lancinating pains announced its putrefying decomposition ; a violent inflammation attacked the skin of the breast and all the surrounding cellular tissue ; gangrene was the consequence. The whole mass of the swelling detached itself with the enormous eschar which resulted from the mortification ; a large healthy-looking ulcer followed this loss of substance ; this was got to cicatrise in less than two months.” The following case that happened in my own practice affords an excellent example of the same fact.

CASE 26.—Ellen G. presented herself to me at the Northern Dispensary, with an ulcer of the left mammary region, that extended from nearly the middle line of the chest into the axillary cavity, and measured 5 inches across and 3 inches from above downwards. The raw surface was coated with perfectly healthy looking granulations, and was encircled by a blue line of cicatrisation. The adjacent skin was hardened, fixed and livid, and was elevated at two points into hard, glossy, white nodules—cancer of the skin. The breast and nipple were gone. The right breast was consolidated into one large, stony-hard, easily moveable mass, the size of a bun. In the corresponding axilla was an indurated, tender, enlarged lymphatic gland.

A year and ten months before she had experienced the first symptoms of her disease, the left breast pained her, and she noticed “little lumps in it like bunches of grapes.” It enlarged and broke about a year ago. The tumor of the right breast was of six months standing.

* Nosographie Chirurgicale par M. le Chevalier Richerand, 4^{ieme}. édn. Tom. 1^{er}, p. 255. Paris, 1815.

The treatment adopted was Lot. Plumb. as a local application to the ulcer, and Cod-liver Oil internally. Under this treatment, in the course of two months, a firm, adherent, opaque, venous-colored cicatrix had transplanted the ulcer; her general health improved greatly. To adopt her own words, "she felt quite strong." Some time afterwards however this patient died in the Middlesex Hospital, with enormous sloughing chasms in the breast, consequent upon local recurrence of the disease with consecutive destructive ulceration.

At this period of the growth it is more especially that those occasional *losses of blood* take place that are not without reason a source of anxiety to the surgeon. Whether "fungus hæmatodes" was a name more derived from the anatomical or the symptomatological nature of these growths is not clear from Hey's account, the originator of the name; that of the French authors of the day, "carcinome sanglante," would seem more to refer to the symptom. These hæmorrhages however are certainly not restricted to the *softer* forms of carcinoma. Hæmorrhage from the nipple is not an uncommon accompaniment of the early stage of scirrhous of the breast.* This observation is as old as Hippocrates. In the 5th book of the Epidemics is the case of "a woman in Abdera, who had a cancer in her breast,

* M. Richard, who has called particular attention to this phenomenon, observed a bloody or serous discharge from the nipple in some thirty cases of tumors of the breast, and was led to believe, from his researches, that it only occurred in benignant tumors of that organ. Velpeau, however, whose great experience cannot fail of impressing us with an unusual degree of confidence in his inferences, states that he has met with these symptoms most commonly in the malignant forms—a statement in which, I apprehend, most of our English surgeons will feel inclined to coincide. Sir C. Bell regarded hæmorrhage from the nipple as of bad augury. The practical fact to be remembered, is not to lay undue stress on the symptom adverted to—not to allow it any great predominance in the evidence before us in a given case.

and from whose nipple there flowed a bloody sanies. The discharge being stopped she died." Morgagni (De Sedibus et Causis Morborum, Vol. III., p. 44) quotes cases from Riverius and Lanzonus, in which "a green milk exuded from the breasts;" another, in which "a black very acid milk;" and a third, in which "a rather thick liquid of a deep black color could be expressed at will from the breasts, and which made the lint, in twenty-four hours, like verdigris." These discharges were probably blood or purulent matter altered in physical aspect. From the surface generally in the more advanced stages of the disease, it forms a distressing source of exhaustion to the unfortunate patient. The same remark applies to carcinoma of the uterus. I have not unfrequently, however, been told by patients that losses of blood, to a certain extent, often mitigated the pains they suffered in their tumors.

Few cases of malignant disease run their course, without giving rise to *pain*, often, especially in the latter stages, of the most harrowing description. The kind of pain has for a long time attracted the attention of practical surgeons, and the so-called "lancinating" variety of that symptom has, by some, been regarded as almost peculiar to cancer. That the "benignant or malignant character of a tumor should be confidently predicted from the absence or presence of this sign," is as irrational, as it is dangerous; that it is not an unfrequent concomitant, especially of the harder forms of cancer, and so of some value as corroborative evidence, cannot be denied. Of the highly expressive terms in which patients give utterance to their feelings, I may

cite such words from my note books, as pain which "drives in like a dart,"—"as if a person were running the point of a knife into it (the tumor), and then drew it back again"—pain of a "plunging nature, as if a bundle of forks were driven into the part." Such are among some of the numerous fanciful, but striking similes that they adopt to convey an adequate idea of their sufferings.

There is a character in the pain of cancerous tumors (especially of non-ulcerated scirrhus of the breast) which, not without its significance, although but cursorily noticed by some surgical writers,* does not seem to have attracted a due share of attention. It is its *intermittent* character. The patient may feel nothing but an uneasy sensation of weight and stiffness in her breast during the greater part of the day, but is worried every now and then by a succession of darting pains, which soon go off to recur again some time after. In some cases the pain is *re-mittent*: the patient is never absolutely free from pain, but experiences at intervals violent exacerbations. These latter are not unfrequently of a different kind of pain to that which is felt constantly.

In tumors of the breast in women, the pain is not uncommonly more severely felt at the menstrual periods. This was known to Morgagni. I have observed it several times myself.

A fact of great practical importance, both in a diagnostic and operative point of view, is the existence

* "The pain is.....not constant, but attacking the patient by fits." ("Syme's Principles of Surgery." London, 1842, p. 72.) Lobstein ("Traité d'Anatom. Patholog." Paris, 1829, Vol. I., p. 410,) has also directed attention to this fact.

or non-existence of any *engorgement of the lymphatic glands* in the neighbourhood of the tumor. The importance of a due estimation of the nature of this fact can hardly be overrated. In the cancerous infiltration of these glands their swelling is, as a rule, in the early stages of an indolent character, productive of little or no pain, so as often to escape the attention of the patient. Enlargement of these glands may, as is well known, take place as a sequence of any irritation in their vicinity, but if due to simple irritation, there is commonly more or less of an acute inflammatory action set up in them, which is not produced in the chronic invasion of the gland tissue by the cancerous material. A consideration of this circumstance affords us the best guide we have in forming an opinion as to the nature of the lymphatic engorgement in question.

We have now passed in review the leading clinical facts bearing on the diagnosis of external cancer, but cannot quit this part of our subject without offering one general remark. It is this: that with the exception of some special easily recognisable growths (such as epithelioma, *nævi* and lipomata), the *cancerous* form by far the greater proportion of tumors that fall under our eyes. Such is the melancholy truth, and surgeons cannot help having insensibly appreciated it. It is a sort of preconception however, that in the consideration of any individual instance is rather to be guarded against than to be fostered; for without being of a sufficiently sweeping character to acquire a diagnostic value in the *ætiology* of the disease, it is still one of those feelings, if I may so term it, not unlikely to prejudice, to a certain

extent, that dispassionate arraignment of the evidence before us, alone capable of conferring on our diagnosis any weight it may possess. No branch of practical surgery has, however, perhaps made a better marked and more defined progress, than the diagnosis of morbid growths: the available elements—especially the anatomical—have increased, not only numerically, but in precision; so that, in the great majority of cases, the surgeon of the present day is in a position to give his patient an opinion, which approximates, at any rate, sufficiently close to the truth for the solution of all the practical bearings of the case at issue.

CHAPTER III.*

THE ANATOMY OF CANCER.

THE elements on which the diagnosis of a surgical tumor is founded may be divided into two principal sets: the clinical and the anatomical. The former it is which we have been just considering; the latter still remains for us to examine into. It would be foreign to my purpose to enter into any long disquisition on the naked eye characters of scirrhus and encephaloid; they are well known and have been well described.† But, for the sake of completeness, the following brief descriptions are here given: ‡ —

Scirrhus (of the Breast) forms a hard, firm, compact, tough mass, that cuts clean, offering a sharply defined section. Such a section has a translucent, opalescent appearance; its general color is bluish-white (that of mother-of-pearl, or of a thin layer of diluted milk); but closer inspection shows it to be pervaded by a buff-colored, opaque substance, disposed either in the form of irregularly branching threads, or of pin-head sized

* In a Natural History of Cancer, this Chapter should have preceded Chapter II.; in the *Diagnosis* of Cancer the present is its proper sequence.

† Vide especially Vol. II. of Mr. Paget's 'Surgical Pathology.'

‡ These general descriptions have been drawn from a tabular analysis of a number of individual descriptions, and thus represent what may be termed the *average* appearances of these tumors.

points; these are the fine ducts of the mammary gland, the presence of which is also indicated by their cut patent orifices. The section displays little or no vascularity. These scirrhus masses in the breast do not form circumscribed, well-defined tumors, but lose themselves by branching out (infiltrating?) into the adjacent healthy tissues; these latter consist principally of the fibrous septa of the mammary gland and of fat lobules; the latter, conspicuous by their contrasting color, are often seen forming yellow islets in the ramifications of the scirrhus mass. Commonly, a more or less turbid thick fluid ("cancer-juice") may be expressed from a section.

Encephaloid Cancer does not usually occur as a diffused infiltration, but most commonly forms a distinct, circumscribed tumor, enveloped in a pseudo-cyst of fine cellular tissue. These tumors are generally more or less lobed and tuberous, the lobulation not being confined to the surface, but extending through the entire substance of the growth. In other respects perhaps no other morbid product presents such variable features. Some of these tumors have an almost scirrhus hardness ("firm" medullary cancer); others are a diffuent pulp; between these extremes all intermediate stages are met with. They generally have a certain degree of translucency (attaining its maximum in those forms that so closely resemble foetal brain in their aspect); but some are perfectly opaque. The predominating tint is cream-color, with a shade of grey or of ochre-yellow; but in some cases the ground color is eclipsed by the secondary tints in its intensity; add to this that these tumors vary

in vascularity from the most delicate suffusion and finest injection to the most extensive extravasations into their substance, till they often resemble rather clots of blood than anything else ("fungus hæmatodes"), that this blood may be more or less altered in color by extraneous agencies: then may some idea be formed of the anomalous appearances some of these growths assume—truly "a strange, distempered mass." It is not uncommon to find on a section of an encephaloid tumor patches of a friable, mealy, unctuous, orange-yellow ("phymatoid") substance, closely resembling crude, yellow tubercle in general appearance: the microscope has proved this to be a fatty degeneration of the cancer elements. Encephaloid tumors are generally more or less succulent, yielding a creamy fluid on being pressed.

Some very remarkable forms occur in the medullary cancer of bone.

In February, 1854, I had an opportunity of examining the femur of a patient who died in the Middlesex Hospital. The shaft of the bone, immediately below the trochanter major, was expanded into a cavity which contained a mass of tissue of the most strange appearance. It was of an earthy light liver-colour hue (much that of boiled horse liver).* It was soft, yet consistent, and tore with a coarsely fibrous fracture; at parts it retained the impression of the fingers like a piece of putty; scattered through this substance were several irregular ragged pieces of bone. The preparation when I first saw it (about twenty-four hours after death) had a peculiar earthy mouldy smell, quite different to what pathological specimens ordinarily possess. Mr. Sibley, of the Middlesex Hospital, and myself, examined the mass microscopically, when we found it to consist of:—First,

* Subsequently I found Wardrop, describing Fungus Hæmatodes in the extremities, states some parts "more resembling liver."

large finely granular fibres, in great quantity. Second, granular cells of all shapes and sizes. Third, here and there cells bearing some faint resemblance to cancer cells. Fourth, some fibro-plastic corpuscles. In one of the lungs a nodule of unmistakeable firm encephaloid was found. This consisted of all varieties of granular corpuscles, and some cells were observed closely approaching "cancer cells."

Shortly after, a very interesting specimen of tumor of the thigh fell under my notice. The section of this tumor displayed the following appearances :—

- 1st. A fleshy, tawny, elastic mass, which had a distinctly fibrous structure, and here and there exhibited points of translucency and small cavities. This portion of the growth occupied the centre, and formed, as it were, the nucleus of the section.
- 2nd. Surrounding this was a layer of a soft material, exhibiting all the characters of fungus hæmatodes.
- 3rd. At the upper part of the section was a small piece of tissue, having the aspect of very firm white encephaloid.
- 4th. Some bloody malignant tissue occupied the interior of the medullary cavity.

Microscopical Examination:

1°. The "fleshy nucleus," above described, consisted of—

(a). Multitudes of spherical granular cells of very variable size ;
and

(b). Granular fusiform cells, often with one or more caudations conferring on them a very singular aspect, and in rare instances having traces of what appeared to be a nucleus. (Pl. II., fig. 6.)

(c). A very few fibres.

(d). Minute granules and shreds of disintegrated tissue.

2°. The firm encephaloid mass consisted of—

(a). Granular cells with distinct large nuclei which contained nucleoli. These cells corresponded with what is generally accepted as the "Cancer Cell." (Pl. II., fig. 7.)

(b). Free nuclei of the forms of "Cancer Nuclei." (Pl. II., fig. 8.)

3°. The tissue from the interior of the medullary cavity consisted of—

(a). Granular cells of various forms and sizes, representing, as it were, the elements of the fleshy nucleus.

(b). A few caudate genuine cancer-cells and some free nuclei, representing, as it were, the firm encephaloid. (Pl. II., fig. 9.)

(c). Large bright tortuous fibres, not acted on by acetic acid, constituting the principal element of this portion of the growth.

(d). In very rare instances, a very broad, densely and minutely granulated fibre was seen projecting beyond the general mass of the above fibres.

(e). Immense quantities of fine granules of a fatty nature.

Not a single cell which corresponded with Lebert's "fibro-plastic cell" was observed at any stage of the examination of the entire growth.

Some years since Mr. Erichsen amputated the knee for malignant disease of the head of the tibia. The compact structure was expanded into a shell of bone not a line thick, which adhered to the subjacent tumor. A section of this exposed (1°) a firm, but elastic, light tawny material, which inferiorly had a more grained yellow-ochre tinted appearance. Altogether this section exhibited a strong resemblance to the "nucleus" of the preceding case. On cutting deeper (2°) a soft grey substance came into view; this was not unlike some of the softer varieties of encephaloid; but on further examination at the back of the head of the tibia, under cover of some muscular fibres a small piece of a firm, white, lobulated tissue was discovered, with all the obvious characters of firm encephaloid cancer.

Microscopical Examination:

1°. (a). Broad fibres rendered indistinct by acetic acid.

(b). Cells of a fibro-plastic nature. (Pl. II., fig. 10.)

(c). Cells approaching slightly the cancer cell. (Pl. II., fig. 11).

2°. (a). Ovoid nucleolated nuclei.

(b). Tolerable specimens of cancer cells. (Pl. II., fig. 12.)

3°. Consisted nearly exclusively of typical specimens of cancer cells. (Pl. II., fig. 13.)

No one of the preceding cases of cancer of bone contained any cancer-juice.

From the above cases, and some others, I have been led to conclude that cancer of bone may present itself

1st. In the ordinary well-known form of the disease ;

2nd. In the most anomalous conceivable anatomical condition, such as is not to be appreciated as malignant disease, excepting by a previous acquaintance with intermediate conditions ;*

3rd. In the intermediate conditions alluded to.

Now, what is very interesting is, that the microscopic elements of these three varieties of cancerous tumor correspond closely in their degree of distinctiveness to that of the naked eye appearances of the growth.

Both forms of Cancer, Scirrhous and Encephaloid, are liable to fatty degeneration. This sometimes invades the growth in the form of small net-like figures (“*reticulate cancer*,” MÜLLER), or of simple aggregations of a yellowish white, friable, unctuous substance—(“*Phymatoid Matter*,” LEBERT). This latter consists mainly in an atrophy and shrinking of the cells of the growth, the fatty degeneration playing only a secondary part in the process, whilst it constitutes the primary change in cancer-reticulum.

Virchow states that the next retrograde step of cancerous tumors is the degeneration of the reticulum or phymatoid matter into an emulsion—“the cancer-milk”—that this gets absorbed, the fibrous stroma consolidates into firm, hard, resisting layers, which have the power of contracting, and constitute “cancer-cicatrices.” To the contraction of these he ascribes the umbilication of cancerous nodules of the liver, the retraction of the nipple in mammary cancer. Cruveilhier’s “cancer chronique atrophique” is, according to Virchow’s views,

* The peculiarities of appearance that cancer of bone often assumes, have not escaped the acute observation of Lebert ; but the five varieties of physical aspect he notices do not embrace the variety I have endeavoured to illustrate in the text.

an instance of the universal degeneration of a cancerous tumor into one mass of cicatricial tissue.

The microscopic characters of morbid growths generally, being still *sub judice*, must receive a more lengthened consideration.

Of the cell-forms that chiefly interest us, pathological anatomists distinguish two principal ones—the cancer cell and the fibro-plastic cell. Other, if we may so term them, *pathological* cells, such as the pus cell, the exudation cell, occurring, as they do, only as secondary products in the evolution of tumors, have little, if any, value in a diagnostic direction.

The following will, we believe, express pretty fairly what the CANCER CELL is, when seen in its most typical form:—

1. The cell *wall*.—Outline delicate, often so faintly marked as only to be appreciated under certain adjustments of the light; generally spheroidal, but not uncommonly more irregular; sometimes offering one or more caudate prolongations, and so giving rise to the most fantastic forms; very variable in size.
2. The *nucleus*.—Outline strongly marked; ellipsoidal, sometimes spheroidal, in shape; generally large in proportion to the size of the cell; its own absolute size tolerably constant, even in different specimens; has often a “stumped” appearance, but may have a more granular aspect; contains one or more bright nucleoli, in the most typical specimens of unusually large

size.* There may be more than one nucleus; these polynucleated cells are held to be especially diagnostic.

3. The *cell-contents* are in the best specimens of a dotted, more rarely of a granular appearance.

Illustrations of these various points will be found in Plate I., figs. 1—5.

In some cases the nuclei are the only characteristic elements observed. An almost invariable accompaniment of the cancer-cells are certain large yellow or brown granular cells, which owe their granulated aspect to a large quantity of closely packed fat globules; these are held to be cancer-cells which have undergone a fatty degeneration.† Some fibro-plastic cells may not uncommonly be observed here and there. Fibres may generally be seen of the characters of those of ordinary cellular tissue in more or less abundance. These are the organic forms which, together with multitudes of minute fat globules and debris of disintegrated tissue, form the elements of the so-called "cancer-field"—remarkable in most instances for the variety of its

* The *vesicular* character of the nucleolus, as contra-distinguished from the mere *dot* which constitutes the nucleolus of the nuclei of innocent growths, is an important diagnostic character. M. Léopold Ollier has justly laid considerable stress on this point.

† Virchow describes two principal modes in which this degeneration may take place:—

1. Gradually increasing deposition of oil-globules in the nucleus—disappearance of the shell of the nucleus—propagation of the fatty degeneration to the cell-contents—disappearance of the cell-wall, leaving at last but an aggregation of oil-globules.
2. The same process beginning in the cell-contents.

constituents and of the forms of these latter, *inter se*.*

The FIBRO-PLASTIC CELL is characterised by its extremely elongated slender form and a well-defined ellipsoidal nucleolated nucleus; this may occupy the middle or the end of the cell, has generally a yellowish tint, and often bulges out the cell wall where it is situate; it, as indeed the whole cell, is transparent, with little or no appearance of granulation; the nucleolus (or there may be more than one) is small and punctiform. Pl. I., figs 6 and 7, exhibit these characters in their typical condition.

It is not uncommon, however, to find all degrees of elongation between these filamentous cells and perfectly spheroidal ones in one and the same specimen, shewing clearly that the two are but extreme cases of one and the same organic element. Such a series of transitional forms may be seen in Pl. I., fig. 8.

* The cell, the characters of which we have just been describing "cancer-cell," has been designated by M. Léopold Ollier ("Recherches Anatomopathologiques sur la Structure intime des Tumeurs Cancéreuses," par Léopold Ollier. Montpellier, 1856,) as the *macrocyte* (from *μακρός*, great and *κύτος*, cavity); by M. Robin as the *thnetoblast* (from *θνητός* mortal and *βλαστός*, germ). "Thnetoblast" is as objectionable as "cancer-cell," both implying that the malignancy of a tumor and the presence of this peculiar form of cell in the tumor are necessarily concomitants—an implication which research has proved to be false. Willing as we are to concede to M. Ollier the merit of having proposed the word "macrocyte"—which, implying nothing further than a peculiar *form* of cell, without reference to any clinical import this may possess—is free from the objections that attach themselves to the word "cancer-cell" and "thnetoblast," we nevertheless consider that, till our knowledge of the relations between the anatomical and the clinical characters of morbid growths rests on a more secure basis, than it does at present, any innovation in the nomenclature of the subject is more likely to create confusion, than to be productive of any really useful result. We shall therefore in the following pages still retain the term "cancer-cell," understanding by it an *anatomical* element independent of any clinical relations.

A third form of cell, to which Paget has especially directed attention, occurs in a group of fibro-plastic growths, which that distinguished pathologist has separately described as "Myeloid Tumors."

These MYELOID CORPUSCLES are "large, round, oval or flask-shaped, or irregular cells and cell-like masses, or thin disks of clear or dimly granular substance, measuring from $\frac{1}{100}$ to $\frac{1}{50}$ of an inch in diameter, and containing from two to ten or more oval, clear, and nucleolated nuclei." (*Vide* Pl. IV., fig. 6.) They occurred in large numbers in the tumor of the orbit referred to at page 26. I found them in a small yellowish white tumor, of the color and consistence of a potato, on the dura mater of a woman, who died after amputation of the thigh.

It is well known that fibro-plastic cells are not uncommonly found among the cancer cells of well marked specimens of cancer. (*Vide* Pl. I., figs 9 and 10.) Indeed, as we have already had occasion to advert to, there are on record cases of tumors which were composed exclusively of fibro-plastic elements, yet proved subsequently quite as malignant, as the most marked cases of cancer. Lebert, as is well known, strenuously insists that the cancer cell and the fibro-plastic cell are two distinct entities—distinct in their anatomical relations, distinct in their clinical import. But it is not uncommon to find cells which have as much the garb of one as the other, and now and then cancerous tumors will be found composed of caudate cells, scarcely, if at all, distinguishable from some forms of fibro-plastic cells. (*Vide* Pl. I., fig. 11.) Valentine described these

as constituting normally the structure of encephaloid growths, and Müller states, "they are as frequently met in non-carcinomatous, as in medullary growths." And conversely, cells are sometimes observed in non-cancerous tissues, which cells, had they occurred in a surgical tumor, would at once have been pronounced prognostic of the worst to the patient from whom the tumor had been removed. Velpeau excised a portion of the calcaneum and astragalus for caries. M. Broca found abundance of cancer-cells in some of the granulations. The case did perfectly well. I met with a case of precisely the same description. Mr. Erichsen excised the head of the femur for old standing hip-disease. In some granulations coating the carious bone I found some cells which certainly approached most closely the "cancer-cell" in their forms and proportions. (*Vide* Pl. I, fig. 12.) The next figure illustrates the same fact in a less degree.

The epithelial cells of the lining membrane of the ureters of the fœtus (*vide* Pl. III., fig. 1) bear a striking resemblance to cancer-cells. Indeed, it would be difficult to lay down any one character, capable of distinguishing them from these latter. Virchow (in Müller's Archiv. for 1847, p. 106) has directed attention to the same fact. "Compare the diversified forms which occur in the ureters and urinary bladder, especially of newly-born infants, with cancer-cells, and shew the differences. Here, too, are large and broad, caudate, angular, star-shaped, club-shaped, etc., cells, with horny membrane, with molecular contents, all large, oval, dark, and sharply outlined, single and double nuclei, with one or two

large brilliant nucleoli." Virchow concludes this part of his paper by stating that he does not consider it established that cancer-cells should be regarded as an heterologous element.*

Another class of facts that has presented itself to my notice is, that in several tumors, the pathology and obvious anatomy of which stamped them cancerous, while I have found typical cancerous and typical fibro-plastic cells, I have found such different gradations between these two extremes that it was often impossible to say to which type a given cell belonged. Pl. II., figs. 1, 2, and 3, and Pl. III., figs. 3, 4, and 5, exhibit this observation in a systematic form.

From the above considerations I venture to lay down the following proposition:—*That there do exist cell-forms, which it is difficult or impossible to refer either to the cancerous or fibro-plastic type exclusively; and, as a corollary, That the existence of such forms brings us to the conclusion, that the two forms of cell cannot but be regarded as the extreme links of a chain of forms connected by intermediate stages.*

Should this proposition and its corollary become verified by subsequent observation, an important truth will be established, which while it on the one hand is in conformity with the unity of natural products, goes far to explain anomalous cases.

In further support of my opinion, I may quote the following authors on the subject.—Walshe: "The sphe-

* As an extreme case of what an imperfect knowledge of organic forms may lead to, I may mention I have succeeded in *making* artificial nucleated cells by the evaporation of an ætherial solution of fat.

rical cancer-cell being formed, the production of the caudate cell follows as an effect of elongation of opposite points of its circumference. And these caudate cells eventually pass into the state of filaments, and form the elements of fibrous formation." Wedl: "A great analogy between them (morbid growths described as *cancer*), and the new-formations of connective tissue cannot but be recognised. * * * The fundamental character of *cancer* is that of a malformed (aborted) and degenerating new-formation of connective tissue." Vogel's words are especially corroborative: "Scirrhus must be regarded as a combination of encephaloid with fibrous tumor. There are thus an endless number of transition forms, the extremes of the series being on the one hand encephaloid, and on the other fibrous tumor."

Virchow has seen in a cancer of the uterus cells far exceeding in elongation any he has observed in fibro-plastic cells, and on the other hand nuclei and nucleoli in fibro-plastic cells not distinguishable from those of cancer-cells. Lebert, on the contrary, considers the greater breadth, the less degree of elongation and the appearance of the nuclei and nucleoli of the caudate cancer-cells as distinctive marks. These distinctions are often available; that they are invariably so I positively deny.

Before concluding this part of our subject, we may reasonably be expected to express, formally, what our own opinion is of the value of the microscope in the diagnosis of cancer. We hold:—

1. That in the greater number of cases of cancerous tumors the so-called cancer-cell will be found.

2. That this form of cell is occasionally seen in growths manifestly innocent.

3. That *vice versa* (what is, however, less frequent) tumors anatomically innocent prove clinically malignant, that the cancer-cell is not the *sine quâ non* character of cancer.*

4. That the inferences drawn from the microscopic examination are not to be deduced from a few isolated cells that may have happened to strike the eye, but rather from the characters of all the cells and of the field of view generally.†

5. That the results afforded by the microscope must take a position, but not an exclusive and overbalancing one, in the series of data, which are to serve us as the premises for our conclusion.

* It appears to me incompatible with our present state of knowledge to admit that, because two organic elements are the same to the *eye*, that, ergo, they are identical in *nature*. How would the microscopist distinguish two isomorphous crystals under his glass? To him arseniate and phosphate of soda would be the same substances! "Unprejudiced observation will satisfy any one, that he would, but too often, be the victim of delusion, in laying too great a stress upon the value of the supposed characteristics of the so-termed 'cancer-cells.'" (Busk's translation of Wedl., p. 526.)

† "From observing a single cell under the microscope, it is impossible to decide with certainty whether it is cancerous or not."—Vogel's Pathological Anatomy, translated by Dr. Day, London, 1847; p. 294.

CHAPTER IV.

COLLOID CANCER.

COLLOID CANCER, although not uncommonly met with in medical, is in surgical practice of comparatively rare occurrence. The following series of cases will serve to illustrate the characters and intimate nature of this remarkable form of growth.

CASE 27.—*Post-mortem appearances of a case of Colloid Cancer of the Rectum, Inguinal Glands and Lungs.*

The Rectum was surrounded by a dense, thick layer of morbid material, by which its calibre was constricted: below the stricture the mucous membrane was of a mottled, dark claret color and roughened (ulcerated); above the stricture it was dilated, and exhibited diffused florid red patches (of inflammation). The colloid deposit appeared at the first glance of a brick-dust tint; but on close inspection was found to consist of a perfectly transparent hyaline matrix, that projected from between the meshes of an opaque stroma in points of the size of a pin head. *The Inguinal Glands* (of the right side) were much enlarged, on section the color of a turnip, and translucent, pervaded by opaque streaks that had a somewhat radiated arrangement. *The Bladder* was extremely contracted, its mucous membrane somewhat thickened and tuberculated, and about the neck and bas fond acutely inflamed.

The Lungs were riddled by colloid nodules: these formed perfectly defined tumors in the pulmonary tissue, varied in size from that of a filbert to that of a pea, were round in form and firm in consistence,

so as to cut clear and sharp. Such a section was grey and transparent, but with the aid of a common pocket glass seen to be traversed by innumerable fine opaque bands, which by their interlacement formed minute cells. Here and there was some delicate vascularity and dendritic, black (melanotic?) discoloration. Some of the tumors were of an opaque brick-dust color. In the apices of both lungs were a number of scattered grey, semi-transparent tubercles.*

The microscopic anatomy of these different deposits was that of colloid cancer generally. Fibres (on which acetic acid developed oat-shaped nuclei) forming by their close interlacement minute alveoli filled with a homogeneous structureless jelly. The "brick-dust" color observed in the rectal and pulmonary deposits was due to a fatty degeneration of the elements.

CASE 28.—*Colloid Cancer of the Peritoneum and Ovary.*†

Elizabeth L. was a patient of Dr. Hawkins in the Middlesex Hospital. Her general health had up to about the 64th year of her age been singularly good, when she noticed that her appetite began to fail, and that she suffered from a sense of fulness and constriction about the abdomen after food. Her digestive functions continued unimpaired; neither vomiting nor costiveness had ever troubled her. At the time she first came under my observation, the whole abdomen was swollen out by an enormous tumor (which then appeared to me to be the liver) occupying the entire front of the belly, excepting the iliac regions, where from the clearness of the percussion note (even on deep percussion) the bowels seemed to lie. The surface of the tumor felt irregular. She died within five months from the apparent commencement of her malady.

Post-mortem Examination.—On laying open the abdomen, the first appearance that struck the eye was a large tumor that appeared to be

* In my case-books I have recorded the description of "Colloid (?) of the Lung." "The lung was infiltrated by a jelly-like substance, varying in hue from grey to amber, perfectly transparent, encysted in the form of globular masses." No similar disease was found in any other part of the body.

† Professor Bennet has in his "Cancerous and Cancroid Growths," narrated a nearly identical case.

the liver infiltrated with colloid cancer, but which a closer examination soon proved to be an immense mass of this growth formed in the *great omentum*. This tumor measured about one foot three inches across ; its upper surface was nodulated about to the same degree as a well-marked cirrlosed liver, but the deep surface was much more irregular and tuberoso. It varied in tint from a pale straw color to a mere opalescence : at some parts was a considerable amount of fine, florid injection. The whole of the *peritoneum* was strewed over with botryoidal masses of the morbid growth, which on the diaphragm formed one continuous layer. The mesenteric serous membrane was similarly studded with colloid tumors, which, along the line of attachment of this membrane to the bowels, formed a necklace-like string, whilst there was hardly a single deposit on the peritoneal investment of the bowels themselves. The *liver* was quite free from the disease, shewing only a fine, yellowish mottling of its substance (biliary congestion). The gall-bladder contained a number of angular gall-stones. The *spleen* was rather small ; the *kidneys* somewhat congested. The left *ovary* was converted into one large (6 in. \times 6 in.) lobed tumor, surrounded by a fibrous, locular cyst. A section of this tumor displayed all the characters of colloid cancer :—a fibrous stroma, which in some parts predominated, in others only formed the partitions of cells which were filled with a flickering, yellowish, transparent jelly.

The thoracic organs were free from morbid deposits of any kind. The *left lung* weighed $7\frac{3}{4}$ oz., was emphysematous above, condensed and carnefied below, and floated in an immense quantity of dirty olive-colored serum, which had been effused into the cavity of the pleura. The *right lung* weighed $11\frac{1}{4}$ oz., was highly emphysematous, its postero-inferior border being alone condensed. In this pleural cavity was about a pint-and-a-half of fluid. The *heart* was pale and flabby ; the aorta had some calcareous concretions in a line with the free margin of the semi-lunar valves. The *brain* was healthy ; each choroid plexus however terminated in a cluster of transparent, bluish cysts.

The physical characters of the peritoneal colloid were nearly identical with those of the inguinal glands and lungs described *suprà* in Case 27. The following is however an independent description. Its

color was that of the serum of the blood, excepting some opaque white patches; translucency was a marked feature of the growth. It cut crisp with a finely granular even surface, which to the naked eye shewed no appearance of loculation. But when a fine section was placed between two pieces of glass, and viewed by transmitted light with the aid of a simple lens, a most beautiful honey-comb structure became at once apparent: this structure was still more evident under a $\frac{1}{4}$ -in. object-glass of the compound microscope, which also brought into view some aggregations of round, granular corpuscles,—“colloid bodies.” A good many oat-shaped nuclei were also observed.

The difference of structure of the ovarian and peritoneal colloid was, that in the former the alveoli were large, and visible to the naked eye, whilst in the latter, its alveolar structure could only be made out by the method adverted to above.

CASE 29.—*Colloid Cancer of the Thigh: repeated recurrences after two successive operations.*

This interesting case occurred in the private practice of Professor Quain, through whose kind permission and assistance I am enabled to place it on record.

Miss B., aged 35, single, thin and rather sallow, had a swelling at the back of the thigh about twelve months before it was removed; she had complained of some uneasiness about the knee for several years previously. The tumor had increased rapidly in size during the last two months: it appeared oval in form, moderately firm and elastic; some parts felt softer than others—almost fluctuating: punctured here with an exploring trocar, a little clear glairy fluid exuded, together with some blood.

Mr. Quain removed the tumor on the 11th of June, 1855. He found it separable from the structures of the thigh without much difficulty or hæmorrhage. The sciatic nerve was stretched out over the tumor's capsule, with which it was so closely incorporated, that the operator was induced to leave that portion of the capsule unre-
moved to which the nerve adhered, thus preserving, as far as possible, the continuity of the nerve. After the operation the patient could feel a pinch of the heel.

The tumor, after removal, was seen to have the form of an ellipsoid, the long axis of which was 9 inches, the short axis 6 inches. It weighed $4\frac{1}{2}$ lbs. It was invested by a firm, moderately thick, fibrous capsule, which was easily separable from the contained substance by the handle of a scalpel. A length-section proved the growth to consist mainly of transparent gelatinous lobes, separated from each other by opaque white bands. This gelatinous material resembled ordinary size in color and consistence, was here and there stained by sanguineous exudation, and permeated by numerous fine blood-vessels. At the upper part of the section was an opaque, cream-colored lobe, with only scattered minute points of the jelly; along one of its sides was a somewhat opaque patch, the color of slightly putrid muscle, dotted over by the sections of cut vessels. A few parts of the growth were of the consistence of the most dense cartilage, with all the peculiar translucent, pearly appearance of that tissue, and contained some white, gritty particles of calcareous deposit in their substance.

Microscopic appearances.

(1.) The "*gelatinous*" substance, treated with ether, and examined with an $\frac{1}{8}$ th-inch object-glass, shewed a slightly fibrous texture, studded over with cells and nuclei, resembling cancer elements.

(2.) The "*cream-colored lobe*," which had all the appearance of ordinary "phymatoid" matter, was a fatty degeneration of the morbid deposit.

(3.) The "*cartilaginous*" portions of the tumor agreed in structure with foetal cartilage at some parts, with fibro-cartilage at others. (Pl. IV., fig. 3.)

Some months after the operation a similar tumor grew near the situation of the first. This Mr. Quain removed about twelve months after his first operation. Dr. Jenner informs me this second growth agreed essentially in its physical characters with the first. Since then the disease has recurred for the second time; yet the patient's general health remains comparatively unimpaired.

CASE 30.—*Colloid Cancer of the Peritoneum and Spleen.*

M. C., aged 49, twelve months before death first observed her abdomen enlarging: in each iliac region existed a firm, tense, elastic

tumor; which gave the impression of ovarian dropsy; the abdomen generally was considerably enlarged and fluctuating. Throughout her illness the urine was deficient in quantity, but free from any deposits. The post-mortem examination (of which a detailed account will be found at page 320 of the 3rd vol. of the "Transactions of the Pathological Society") proved this to be a case of colloid of the peritoneum and *spleen*, this organ "containing, in its interior, large masses of the colloid matter, totally unconnected with its capsule."

CASE 31.—*Description of a Preparation of Colloid Cancer of the Liver and Mesenteric Glands.*

In the Museum of University College Hospital is a preparation, No. 4,006, described as "Colloid Cancer of the Liver, Pancreas and Mesenteric Glands." The preparation of the liver is a length-slice of that organ, including the gall-bladder and lobulus Spigelii. On one surface are the sections of seven, on the other of nine colloid tumors in the substance of the liver. The largest of these sections has diameters of $2\frac{1}{2}$ and $1\frac{5}{8}$ inches. On the upper and lower edges of the slice the more superficial tumors cause tuberos elevations. The growths are tolerably defined, but in some cases shade off into the adjacent healthy hepatic tissue; all have a minutely cystic structure given by a dense sponge-work of trabeculæ, inclosing an hyaline material, which however in most instances has escaped; their microscopic characters are those I have observed in other colloid cancers.

The pancreas has one single cyst attached to it: it can hardly be said to be "Colloid of the Pancreas," as described in the catalogue.

The mesenteric glands are enlarged by cystic disease in all respects identical with that of the hepatic tumors.

It must not be supposed that all tumors which have a gelatinous appearance are *ergo* cancerous: some are certainly not so; others seem to occupy an intermediate station, irreferable, notwithstanding all the modern aids of diagnosis, absolutely either to the malignant or non-malignant class of growths.

Soft Enchondromatous Tumors occasionally closely resemble colloid cancer in their physical aspect, but generally admit of diagnosis, both from their clinical course and minuter anatomical structure. Mr. Paget has mentioned such a case.* "The tumor below the clavicle was removed. It was an oval mass invested by a thin fibro-cellular capsule, partitions from which intersected it, and divided it into lobes of unequal size, distinct, but closely packed. They all consisted of a soft, flickering, yellow, and pale ruddy substance, widely intersected with opaque-white lines. The substance was extremely viscid; and could be drawn out in strings, sticking to one's fingers, like tenacious gum." This tumor, however, had "*no alveolar or cystic structure,*" and was an isolated mass, not an infiltration. Its microscopic anatomy and its clinical course were not those of cancer.

A class of tumors that may possibly be confused with colloid cancer is that designated by Mr. Paget as "*Fibro-cellular Tumors.*" They consist essentially of ordinary fibrous tissue, more or less perfectly developed, infiltrated with a serous or synovium-like fluid. The following example illustrates well this class of growths:

CASE 32.—Elizabeth H. was admitted into University College Hospital under Dr. Walshe, laboring from pharyngitis, under which she sank. She had noticed a swelling of the neck for fourteen or fifteen years. It had gradually increased, but had never given her any pain or interfered with her deglutition, respiration or speech. At the post-mortem examination I found a tumor about the size of a goose-egg, situate behind the lower part of the pharynx; it had no connec-

* Op. Cit. Vol. II., p. 187.

tion with the thyroid body, which was rather less than usual. The tumor was ellipsoidal in form and was enclosed in a thick, adherent, dense, fibrous envelope. A section had a light straw-colored, gelatinous appearance, resembling semi-fluid subcutaneous fat (or those soft, œdematous, decolorised coagula, so often seen in the cavities of the heart), and was intersected by radiating delicate bands of fibrous tissue. Two cysts and some cretaceous deposits were in the substance of the growth. A few fine vessels and several effusions of blood were seen on the section. The microscopic constituents of the tumor were delicate fibres, studded over with numerous oblong nuclei. The lungs, liver, kidneys and abdominal glands were sound.

The following interesting case will further serve to illustrate the difficulties of diagnosis sometimes attending these "colloid" tumors:—

CASE 33.—*Colloid (Enchondromato-myeloid) Tumor of the Calf.*

Olive G., æt. 53, was admitted into University College Hospital, under Mr. Marshall, for a tumor of the leg. It had first appeared four years before as a swelling in the ham: this was followed by another lower down the leg. Both tumors had been on the increase and by their coalescence now formed one large growth occupying the whole of the calf of the leg and extending into the popliteal space. Mr. Marshall amputated the thigh in its lower third. The tumor, which appeared to be developed amidst the soft parts of the calf, was some eight or ten inches long and six inches broad. It was throughout of a soft, gelatinous consistence, transparent in thin layers and of reddish and yellowish hues. Its microscopic elements were of a definite nature: round, punctuated nuclei about the size of pus-corpuscles, fixed in a transparent matrix, which in many instances had lacunæ hollowed out in its substance for their reception. These nuclei were also found aggregated into masses, which were here and there surrounded by a cell-wall—"myeloid cells," in fact. The other elements of this growth were fibro-plastic cells and nuclei, fine bands of waved, cellular filaments and a few oil-globules.

The patient died from diffused suppuration of the thigh. At the post-mortem examination the lungs were found inflamed and the kidneys diseased; but there were no consecutive deposits of any kind.

This was by many at the time considered to be a case of colloid cancer. My own opinion was, and still is, that this tumor was one quite *sui generis*, intermediate in its characters between soft enchondroma and soft myeloid. That it was not colloid cancer I infer (apart from the positive characters it possessed of the two other classes of growths referred to) from the absence of any decided alveolar structure either to the naked eye or to the microscope.

Colloid Cancer is best known by its naked-eye characters. Two distinct elements are perceptible:—1st. a *fibrous stroma*; 2nd. a *jelly*; and it is the relative arrangement of these elements that confers on colloid cancers their peculiarities.

The *fibrous stroma* consists of fibrous tissue, enclosing cystic cavities, giving a section of the colloid tumor an honey-comb (alveolar) appearance. A fact on which I am disposed to lay a certain amount of stress is, that (as in Cases 27 and 28) this alveolar structure may be generally perceived on a very fine scale by means of a lens in parts where it is not apparent to the naked eye, clearly proving that this structure is an essential feature of these growths. The greater the amount of fibrous element in a colloid tumor, the harder and firmer it is and the more nearly does it approach in its physical characters an ordinary fibrous tumor. My observations on the intimate nature of the stroma of colloid cancer lead me to suppose that it is partly of a membranous, partly of a fibroid nature.

The cells of the stroma are filled with the *jelly* or proper colloid matter. This in its primary condition is

a structureless, transparent, soft, viscid jelly. It may lose its transparency and acquire greater consistence by two pathological changes: it may undergo a fatty degeneration, when it becomes transformed into a pale buff-coloured, opaque material (vide Case 29); or it may undergo a calcareous degeneration, when it assumes an opaque white appearance, often resembling blanc-mange. The contents of a colloid cyst which had undergone this calcareous degeneration in a case of colloid cancer of the peritoneum is described in my notes as "a dead-white, opaque matter, not at all granular or friable, but very tough and dough-like in consistence, composed of numerous microscopic spherical granules uniform in size, and having a peculiar dark-outline, which on the addition of hydrochloric acid became lighter and less defined, with a copious evolution of air-bubbles." These appearances were first well described by Dr. Jenner, in the 5th vol. of the "Transactions of the Pathological Society." A few cells are generally observed in the colloid matter, much like cancer-cells, together with finely granular nuclei.

The colloid matter often appears to form bodies of a peculiar structure, called "colloid bodies;" for a description of which I gladly avail myself of Mr. Sibley's description in the 39th vol. of the "Medico-Chirurgical Transactions." "These rounded masses of gelatiniform substance, which are termed colloid bodies, or corpuseles, may be composed of a central body or kernel surrounded by gelatinous substance, or may be wholly made up of the latter material. The central portion or kernel may be nearly spherical or ovoid, or it may appear as if splitting

up into several parts. It is often composed of a large number of simple spherical cells, closely packed together, each of which, in many cases, appears to contain a large spherical nucleus The jelly-like substance surrounds the central kernel with a certain degree of uniformity in all directions, like the soft part around the stone of a fruit. It is elastic, and on being indented readily regains its former shape. Occasionally concentric lines may be detected; if, however, the concentric arrangement is not obvious in the natural condition of the structure, slight pressure or the addition of a little iodine or acetic acid will render it apparent."

The colloid matter sometimes preponderates nearly to the exclusion of the fibrous element. In a case reported by Dr. Ballard, it actually lay so free in the abdominal cavity, as to lead to the performance of paracentesis abdominis; more commonly it is enclosed in fibrous cysts, forming clusters of egg-like tumors.

Adopting as the gauge of malignancy those attributes which I have laid down at page 2, colloid agrees with cancer in :

- (1). "Vegetative property:" Cases 27, 28, 30, and 31.
- (2). "Liability to local recurrence:" Case 29.
- (3). Infiltrating property: all the Cases.

Colloid differs from Scirrhus and Encephaloid in :

- (1). Anatomical structure.

This is more a question of degree than extreme anatomical conditions of colloid and of the more ordinary forms of cancer would imply. The fine sponge-work of some colloid tumors (*vide* Case 31) is met with in some forms of encephaloid. I observed it in

some encephaloid of the lumbar glands, in the fungus of the breast, described at page 57, and several other cases I have examined.

- (2). Its predilection for particular organs of the body.
- (3). Its inferior tendency to ulcerative and gangrenous changes.
- (4). Its less influence on the constitution.

In our present state of knowledge it will be best to consider it as a form of cancer. Subsequent research may one day definitively settle the question.*

* Mr. Sibley, in his otherwise excellent paper, has, in his attempt to deny the cancerous nature of colloid disease, generalised far too hastily. Thus, he knew of no instance of colloid "in the substance of the liver, or in that of the lungs." I shall therefore not stop to criticise his views; his premises are insufficient, his conclusions therefore premature.

CHAPTER V.

EPITHELIOMA (*Hannover.*)

EPITHELIOMA has obtained its name from being constructed of epithelium-cells. "Cancer" (?) of the lips, tongue and of the genital organs of both sexes are, as a rule, forms of this disease. I have seen it besides in the skin of other parts of the body, on the face, in the cheek, female breast, dura mater, bones and glands. Consecutively its seat (with but very few exceptions) is the adjacent lymphatic glands.

No general description is adequate to convey a correct idea of the special aspects it assumes in these different situations: each organ may, to a certain degree, be said to possess its own peculiar form of the disease.

The *lip* (commonly the lower one), when affected, is swollen and hardened, its mucous membrane glossy from tension and livid from congestion; beneath the membrane numerous minute, yellowish-white, opaque, seed-like bodies may be commonly seen shining through. The surface of the tumor may be more or less tuberculated. On dividing an epithelioma of the lip, it usually exhibits a columnar structure.

The *tongue*, thus diseased, is well illustrated by the following cases:—

CASE 34.—*Epithelioma of the Tongue : Death : Autopsy.*

William S., aged 51, was coming down stairs in the dark, with a pipe in his mouth, when he ran up against a wainscot and wounded his tongue. About a month afterwards he noticed a small lump underneath the tongue; it looked white and felt hard, like the kernel of a nut. It soon got larger; he fell away and became very weak. When I saw him the whole tongue was greatly swollen, its dorsum irregular by lowly, hard elevations of the surface; underneath was a sloughy ulcer. The gums of the lower jaw, on the left side, were the seat of a jagged, foul, fungous ulceration, that extended backwards for a considerable distance. The sub-maxillary glands, on both sides, were enlarged and hardened. The root of the tongue was so swollen, as to prevent him swallowing anything but sops and broths. His speech was exceedingly defective, so that he was obliged to write down on paper any lengthened answer to my questions. He had at times bled violently from the mouth—as much as three pints in a week—his mouth had watered from the very commencement of the disease, and he was constantly spitting up an offensive, tenacious, slightly aerated fluid of a rusty color and containing small clots of blood.

After a time the tongue began to *protrude* beyond the upper lip to the extent of half-an-inch, and the left half of the organ ulcerated away. He died within ten months of the first commencement of his disease, after having sunk into one of the most deplorable states of exhaustion and misery, that it has ever been my lot to witness in this or any other disease.

AUTOPSY.—*The tongue* was completely eaten away on the whole under part, and on the anterior half of the left side above, leaving a sloughy, irregularly nodulated and shreddy surface of a mottled dirty-buff and greenish-slate color. It smelt very offensive.

The Larynx was, with the exception of a small deposit of morbid substance on each side of the epiglottoglottodean fold of membrane, free from disease. *The submaxillary glands* were infiltrated and enlarged.

The Left Lung contained a short distance from its summit a cavity about the size of a Barcelona-nut, lined by recent lymph, and communicating with a medium sized bronchial tube. On the surface were a few small scars, and scattered through its substance were some small, black deposits. *The Right Lung* was in its lower lobe in the second and third stages of hepatisation, in the rest of its substance emphysematous. *The Liver* was pale, its fracture coarse. *The Kidneys* were softened, pale, and exhibited a commencing granular degeneration.

The microscopic characters of the disease in the tongue and glands were those of epithelioma generally.

CASE 35.—*Epithelioma of the Tongue: Death: Autopsy.*

Frances H., æt. 63, had had her tongue diseased five months, when she first came under my observation (October 1st, 1855). The right side of the dorsum of the tongue was very tender, irregularly indurated, and anteriorly the everted edge of an ulcer was perceived; but on account of her inability to raise the tongue from the floor of the mouth, but little of its condition could be seen. There were no teeth remaining in the gums in the immediate proximity of the right side of the tongue. She had lost them long before the appearance of any tumor. The lymphatic glands in the right and median submaxillary regions were swollen and tender. The pain in her tongue she described "as if some one were cutting it," suiting with her fingers the action to the word; this pain "shot through both ears," especially the right one. The tongue had bled several times, but never very much. She was constantly spitting up a slightly brown, somewhat frothy, transparent, tenacious, ill-smelling fluid. At night she managed to sleep by inserting a piece of lint into her mouth to absorb this phlegm. She could swallow broths and rice-pudding very well, but could not eat meat. Her speech was exceedingly indistinct. She was not very thin (although she stated she had lost a good deal of flesh,) but her flesh hung loose and flabby on her.

The tumor of the tongue came first as "a little hard lump" on the side of the organ; she never had any cracks or fissures in this. She never heard of any of her family suffering from cancer or consumption.

In some notes taken February 13th, 1856, I find that "the induration of the tongue and glands had much increased, that of the tongue had ulcerated a good deal. Occasional bleeding from the tongue gave her ease. Her speech was much worse than when I first saw her." In notes taken the following July, that "the right half of the tongue was nearly eaten away, and that from the immobility of the organ she was nearly dumb." She died in October. I examined a portion of the tongue and submaxillary glands, and found them both engorged with epithelial elements; the muscular fibres had lost their striæ, and the substance of the tongue contained many fibro-plastic cells.

CASE 36.—*Epithelioma of the Tongue: Death.*

Ann B., æt. 70, a care-worn emaciated old woman, with a sallow complexion, and no color in her cheeks, saving that imparted by a few varicose veinules. She has suffered from her present disease for nine months. She has had bad teeth for a long while, but is not aware that they ever lacerated or even irritated the tongue. She has lost all her upper teeth—she thinks before the appearance of anything in the tongue; she still has a few of the lower teeth in front; the two or three of the right are decayed and ragged. Her mother died in a decline, æt. 40; her father lived to near a century; she never heard of any tumors or cancers in her family; she has lost a good deal of flesh. On the dorsum of the tongue is a mushroom-like fungus that occupies nearly the whole right half of the organ; has a red, granulated, slightly sloughy, moist look, and feels hard to the finger. Internally its free margin overhangs for about half an inch the surface of the tongue; the lingual aspect of this border appears covered with a smooth purplish mucous membrane, continuous with that of the general investment of the organ; externally the margin reaches below the level of the tongue into the general cavity of the mouth. Below the right ramus of the jaw is a gland greatly enlarged to a diameter of two inches, and there are numerous other glandular enlargements (down the whole of the right side of the neck, a few about the larynx, one on the left side of the neck).

She suffers a good deal of pain in the tongue, radiating to the ear, neck, and back of the head—so intense at times that she com-

pares it to "pistols being fired off in her head." The fungus has sometimes bled a little in her straining to swallow. This is greatly impaired ; she swallows liquids and solids together better than either separately.

She has constantly her handkerchief to her mouth to wipe away the foetid saliva and mucus that are distilling away. While I was examining her, she all at once spat up a quantity of mucus of a slightly brown color, somewhat frothy and of astonishing tenacity. She tells me "it will sometimes reach across the room before she can get it out of her mouth." She spits up in this way about a pint of mucus a day, and finds that the inhalation of cold air or of the hot air of a fire at once brings on an increased flow of this discharge.

In about two months more this patient died from her disease. "You may form some idea of what she endured," her sister writes me, "when I tell you that at last the throat was entirely stopped up, so that she died for want of food."

Epithelioma, as it occurs in the *penis*, *uterus*, and skin of the *hand* and *foot*, is mostly stamped by a character, which may be considered in a measure pathognomonic of the disease—viz., by a papilliform structure caused by a preternatural enlargement of the papillæ of the part : these are also sometimes considerably deformed (cauliflower epithelioma). The stratum of overgrown papillæ, partially covered and interleaved by crusts of concreted ichor and dirty-white, pasty, broken-down cuticular structures, presents an appearance altogether peculiar. On two occasions the surface of epithelial tumors was curiously convoluted like a miniature brain. I have never seen papilliform epithelioma of the tongue ; this is probably explicable by the epithelial substance being primarily deposited in the submucous tissues—a remarkable fact, strongly invalidating the idea of some

pathologists (Lebert and Bennet) that epithelioma might be regarded as a simple overgrowth of normal epithelial structures, seeing that in no other part of the body are these so highly developed as in the tongue. This leads us to the observation that, in certain other cases, not the cutaneous (or mucous), but the *sub*-cutaneous (or *sub*-mucous) tissues are the primary seats of deposit of the elements of epithelioma. In such cases a simple diffused induration may be the only first symptom observed.

Both forms of epithelioma soon ulcerate, leaving a foul, smooth, irregularly granulated, or tuberculated surface, which exhibits a tendency to sloughing, and discharges a thin, offensive ichor: the borders of this ulcer are usually indurated, jagged, and often everted.

Epithelioma presents on section the following appearances. It is grayish-white in color, generally somewhat translucent, frequently studded over with minute opaque white, or yellowish-white spots of a friable, unctuous material (epithelium scales) which on pressure curl out in corkscrew-like threads, often of considerable length. This characteristic appearance is sometimes obtainable from the cut ends of the small ducts of mammary scirrhus, which are filled with a substance very similar to the above to the naked eye, but really of the "phymatoid" nature alluded to at page 87. The cut surface of an epithelial tumor is but very slightly vascular, nor does any "cancer-juice," properly so-called, exude from it. No growths are more diffused and infiltrating than epithelial ones. I have never but twice seen

anything approaching the encapsuled, isolated tumors of encephaloid substance.

CASE 37.—*Encysted Epithelioma of the Breast.*

This case occurred in the practice of Mr. Arnott, to whose kindness I am indebted for being able to reproduce it here.

An old lady, sixty-eight years old, consulted Mr. Arnott, in June, 1856, for a large hard tumor of the breast, which she had only noticed for a short time before; he saw her again in October, when the tumor had become soft, and removed it.

Mr. De Morgan gave me an opportunity of examining this tumor, shortly after its removal. It was about the size of a tolerably large apple, and consisted of a cyst, packed full of a friable mass of epithelium, which in some places was arranged in the form of short stiff tufts. The cyst consisted of tessellated epithelium scales and brood-cells; its contents of nothing but epithelium scales.

CASE 38.—*Encysted Epithelioma of the Cheek: Puncture: Cure.*

Mr. F., æt. 42, consulted me in November, 1856, on account of a tumor of the cheek, which he had had for upwards of twenty years. It was at first the size of a small pea, soft and movable, and had been gradually growing ever since. Under the skin of the right cheek, close to the angle of the mouth, was a movable, round, smooth, elastic tumor, about the size of a golden pippin: it appeared translucent, when viewed by a lighted taper. It was not connected with the buccal mucous membrane. I opened the tumor with a bistory, and squeezed out about two table-spoonfuls of a matter having the following properties:—It resembled boiled rice, that had been imperfectly mashed, smelt like glycerine, and felt soapy when rubbed between the fingers. Examined microscopically, it was found to consist of hexagonal and elliptical, non-nucleated, epithelium scales, which were not detached, *but formed layers of a tissue.* Professor Quekett examined this tissue with me, and said it resembled most closely some forms of embryonic cartilage, and that from the ear of the mouse. Within a period of three months after I had punctured the tumor, it filled

slightly twice again, when the patient opened it himself, and got out, on each occasion, about a tea-spoonful of the same material. I saw him in January, 1858: the cure was permanent, and he was in vigorous health.

The above characters, together with the columnar, papilliform structure, often observable, leave but little doubt to the practised eye of the pathological anatomist; and any doubt that may remain is at once cleared up by the well-marked microscopic features of Epithelioma.

The most abundant element is the EPITHELIUM-CELL. This is generally of the tessellated variety, characterised by angularity of outline, and the comparative small size of the nucleus to that of the cell. What may be regarded as epithelium-cells in an earlier stage of development, have a less angular form, larger nuclei, and may bear a strong resemblance to "cancer-cells," *propr. sic. dict.*, but this is altogether exceptional.*

As the "cancer-cell" is susceptible of endogenous formations in its interior, so is the epithelium-cell. The next element is not constant, but when present, is highly characteristic and distinctive of epithelioma; it is the LAMINATED CAPSULE of Paget, (the *globe épidermique* of Lebert). This consists of cells, nuclei, or granular matter enclosed in concentric layers of what at first appear to be fibres, but which closer examination demonstrates to be layers of flattened epithelium scales, seen edgeways. Some of these laminated capsules attain a size sufficient to be appreciable to the naked

* Hence Mr. Paget's term "epithelial cancer-cells" is objectionable.

eye. They are not absolutely peculiar to epithelioma, Paget and V. Bärensprung have observed them in other tumors; I observed some myself in a small tarsal tumor I removed from a child. Pl. IV., figs. 4 and 5, illustrate the anatomy of Epithelioma.

Opinions are up to the present day divided on the *nature* of Epithelioma. On the one hand we have such men as Paget, Velpeau and Schuh, calling it broadly Epithelial *Cancer*, whilst, on the other hand, Lebert, Hannover and Bennet altogether deny its cancerous nature. There can be no question that the majority of surgeons have adopted the dark side of the question; and that, firstly, because they so often find themselves unable to *cure* the disease; and, secondly, because the advocates of its non-malignant nature, having taken their ground rather upon the evidence of the microscope than upon clinical experience, have frequently arrived at results, which the subsequent terminations of actual cases have apparently invalidated, and have thus lost the confidence of the purely practical surgeon. To enlarge still further on this latter point—these pathologists have reasoned thus: “Cancer contains a specific element—the ‘Cancer-cell.’ Epithelioma does not contain this, but another normal element of the healthy tissues—the ‘Epithelium-cell’: ergo, Epithelioma is not Cancer” is their syllogism—as faulty logically as it is clinically. Again, in the investigation of this particular question, as in that of the whole subject of cancer, most observers have fallen into the most glaring errors from not having followed up the cases to their terminations, but having contented themselves with those few facts which a mere temporary observation of the

cases may have exhibited. For this very reason, I regret to say that I myself have only been able to arrive at a proximate solution of this important question, since the records of *complete* cases are few, notwithstanding the lamentably common occurrence of the disease; still, when I come to analyse *all* the evidence, I find the approximation to a positive result so close, that I do not hesitate to express, dogmatically, that opinion with which the present chapter terminates.

In order to place both sides of the question in an unequivocal form, I have adopted the following arrangement of facts.

ARGUMENTS FOR EPITHELIOMA

BEING:

I°. CANCER.

1. Its infiltrating character.
2. Its tendency to infect the lymphatic glands.
3. Its tendency to recur after surgical operations.
4. Its fatality.

II°. NOT CANCER.

1. The excessively rare occurrence of consecutive deposits.
2. Its anatomical structure.
3. The absence of any primary cachexia.
4. Its frequently local origin.

ARGUMENTS FOR EPITHELIOMA BEING CANCER.

1. *Its Infiltrating Character*, irrespective and destructive of the natural tissues met with in its progressive

evolution.—This is, it is true, *an* anatomical character of cancer; but it *per se* proves nothing; for whilst on the one hand tuberculous and common exudation matter (*e.g.* in cirrhosis) are often truly infiltrating, on the other hand no tumors can be more definitely circumscribed, than are some encephaloid cancers. I cannot therefore admit that it alone proves anything.

2. *Its tendency to infect the Lymphatic Glands.**
This is common to epithelioma, cancer, tubercle,

* The following case is a remarkable illustration of this fact:—

CASE 39.—*Epithelioma of the Scrotum: Consecutive Epithelioma of the Inguinal, Iliac, Lumbar, Thoracic and Cervical Lymphatic Glands, and of the Cervical Lymphatic Vessels.*

Thomas L., *æt.* 35, had pursued the calling of a chimney-sweep from a boy and his person had during this time been much exposed to soot. At the age of 25, he had a sore on the scrotum, which he “poulticed out.” In about another five years he observed a “wart,” the size of a sixpence, on the scrotum, which subsequently degenerated into a sore. When I saw him at the Middlesex Hospital, under Mr. Shaw, there was a round, flattened, ulcerated growth, the size of a crown piece, at the middle of the scrotum. The ulcer was florid red, tolerably smooth, but warty here and there and its edges were somewhat everted. In the right groin was a hardened mass of glands, in the left one a red partially ulcerated surface, around which the adjacent tissues were indurated for a considerable extent. He suffered a good deal of aching and shooting pain in the scrotum and groins, and after enduring a deal of suffering, died, worn out by his disease.

AUTOPSY.

The *growth in the scrotum* consisted of epithelial cells. *The inguinal, iliac, and lumbar lymphatic glands* were greatly enlarged by a white material, which, as the microscope demonstrated, consisted of epithelial cells. Along the iliac vessels of the left side these glands were diseased to such a degree as to form a large tumor, which had near the sacro-iliac synchondrosis softened down into an abscess and produced a cavity in the iliac bone. The abdominal aorta and vena cava were closely surrounded by morbid deposit, but not otherwise implicated. The *liver* was enlarged, and of a tawny colour; the *kidneys* congested and soft.

The lower lobes of both *lungs* were inflamed. The thoracic lymphatic glands were enlarged and hardened by epithelial disease. Under the pleura, near the spine, were several hard, white tubercles (diseased lymphatic vessels).

The *cervical glands* of the left side formed one large mass of epithelioma, and, what I had never seen before, the lymphatic *vessels* were filled with the morbid substance.

syphilis, the plague, common inflammation; therefore it is difficult to imagine, how any one can for one moment think of saying epithelioma is, or is not a form of cancer, simply because it infects the lymphatic glands.

3. *Its tendency to recur after Surgical Operations.*

This is the main point which surgeons have relied upon, microscopists evaded. But if I prove that this is not an independent character of epithelioma, but a mere consequence of the first—its power of infiltration—then, having already shown that this latter proves little or nothing, I show that this third character proves no more. It is to be regretted that the independent evidence on this point is for the reason mentioned above—the paucity of completely recorded cases—only presumptive evidence, yet, in my own opinion, of a very strong nature. That epithelial “cancer” of the tongue and lips should so constantly recur after operations, need not surprise us; indeed, any one who has dissected these tumors, and observed how marked their infiltrating nature is, how widely they shoot into all the adjacent structures, would feel more surprised if they did *not* return, and more especially, when it is considered that in the case of the lips, a certain stereotyped operation, the V-shaped incision, is often so indiscriminately applied.

If, on the other hand, it can be shown that epithelial “cancers” do not return after *complete* removal, then the recurrence of epithelioma after operations may be legitimately inferred to be no argument in favour of their cancerous nature.

I was hence induced, in my "Illustrations of the Pathology of Cancer," to suggest that "it becomes a question whether complete removal of the tongue and lips, although an operation of extreme severity, would not be more in accordance with the principles of surgery than any partial operation on those organs?" Mr. Syme has recently removed the entire tongue for limited epithelioma, but the man unfortunately died from some intercurrent affection of the lungs a few days after the operation.

The best cases at point are those of epithelioma of the extremities, in which amputation has been performed early before any infection of the glands.

CASE 40.—*Epithelioma of the Foot : Amputation at the Ankle-Joint : no return of the Disease four years and a half after the Operation.*

Mary B. was 71 years of age when she was admitted into the University College Hospital for a malignant ulceration of the foot. She had hitherto always enjoyed good health : no cancer was to be traced in her parents. Many years ago she had a corn about the size of a florin near the little toe ; this she had been in the habit of soaking and cutting from time to time, when, from its size, it prevented her walking. Last January, in going up stairs, she struck her corn, and felt severe pain in it. From that time forwards it had gradually been getting into its present condition. On the outer side of the anterior half of the left foot was a malignant looking ulcer, which extended an inch and a half back on the dorsum, and three inches into the sole of the foot, and rose about half an inch above the general level of the adjacent sound skin. The surface of the ulcer was very rugged from prominent shreds of concreted discharge ; and where this was absent, pale red warty excrescences came into view. The margin of the ulcer was thick and rounded. The skin around had a slight blush, but felt natural. With the exception of the

little toe (which was involved in the ulceration in its posterior half), the toes of the foot were sound. The discharge had a foetid smell; she compared this at times to that "of a water-closet." It had bled several times. During the day she suffered comparatively little pain, of a "gnawing" character; but at night a most intense pain was superadded, which she described as of "a plunging nature, as if a bundle of forks were driven into the part."

She was, considering her age and sufferings, a remarkably healthy looking old woman, with a tolerable amount of flesh on her extremities, her mental faculties most perfect, her spirits excellent. Two days after she had been in the hospital, Mr. Marshall removed the foot at the ankle joint.

Anatomy of the Growth. Its most marked character was that, by gently insinuating the handle of a scalpel, the growth could be split up into several portions: a section through its substance showed this to depend on the columnar structure it possessed, allowing its separation into papilliform shreds. Some portions, however, consisted of a mere granular pulp of broken up structures. The general colour of the structure was dead white, but the individual papillæ had a degree of opalescence. Portions of these were examined microscopically, and then found to consist of epithelium scales, similar to those of healthy cuticle; but in some fields of view multitudes of nuclei were alone seen, the outlines of the epithelium cells being concealed, when in several layers.

After a prolonged stay in the hospital, several abscesses and sinuses having formed in the course of the healing of the operation wound, she ultimately made an excellent recovery.

March 23rd, 1858. The stump continues perfectly sound, being constituted by a firm thick pad of flesh: about an inch above this there is in front a very narrow firm cicatrix. She feels "throbbing" pains in the stump, similar to those she felt formerly in the corn, before the weather changes. She walks once a week to St. Pancras Workhouse and back with the aid of a stick.

Here we have a case of, what the German pathologists would call, the most "exquisite" epithelial "cancer," which has not returned four years and a half after amputation.

Lebert has recorded the total duration of 8 cases of epithelioma of the Trunk and Extremities, as 2, 4, 6, two of 12, 14, 20 and 33 years—Paget, one of 20 years. Now, on the other, hand, it is a remarkable contrasting fact, which is so universally acknowledged by all practical surgeons, that I shall not trouble my readers with any statistical corroboration, that there perhaps exists no class of cancerous tumors in which recurrences of the disease after amputation follows so rapidly and so fatally as in ordinary cancer of the extremities.

Epithelioma of the Penis and Scrotum stand next in their possibility of complete removal.

I have examined microscopically five cases of so-called cancer of the penis: they have all been cases of epithelioma, and have agreed anatomically in their naked eye characters with 22 out of 28 preparations of this disease, which I have found preserved in pathological museums. We may, therefore, fairly infer that scirrhus or encephaloid of the penis is a very rare disease. I know of two cases of epithelioma of the penis which were both operated on in the year 1851, and have not returned up to the present time. Hey speaks of "the permanent cure effected in three cases."

Of Epithelioma of the Scrotum, "Chimney-sweep's Cancer," I shall say no more than that most surgeons must have met with numerous cases of permanent cure, after excision of this growth. Pott says: "If extirpation ever bids fair for the cure of a cancer, it seems to be in this case."

Lebert gives the average duration of life of—

Epithelioma of the lips,	as $3\frac{2}{3}$ years.	
„ „ penis,	as $3\frac{2}{3}$ „	
„ „ vulva,	as $9\frac{1}{11}$ „	
„ „ trunk and ex-	} as $8\frac{4}{11}$ years.	
tremities,		

From this table the very interesting result appears to follow, that the duration of life is in the ratio of the possibility of completely removing the growth.

4. *Its fatality.*

This forms no argument for the cancerous nature of epithelioma. Epithelial tumors kill by their purely local effects: involvement of vital organs, pain, discharges and hæmorrhages.

II. ARGUMENTS FOR EPITHELIOMA BEING NOT CANCER.

1. *The excessively rare occurrence of consecutive deposits.*

This forms one of the most powerful arguments in favor of the non-cancerous nature of the disease.

Those who consider epithelioma a form of cancer will tell you that it *does* (in rare cases) occur consecutively in the viscera. This I grant: but “one swallow does not make a summer.” Epithelioma is a very common form of morbid growth and yet we do not possess more than some half-a-dozen well-authenticated cases of its consecutive deposition.* If these few cases are to form

* Velpeau has seen epithelioma recur in the thickness of the lower jaw, in the upper jaw, and in the liver; Paget, in the lungs, in the liver, and in the heart; Rokitansky, in the liver; Virchow, in the liver.

the basis of the cancerous nature of epithelioma, we are at once forced to admit that all fibrous, fibro-plastic, enchondromatous, and nævoid tumors are all cancerous. These latter may *exceptionally*, as is shown at page 18, *et seq.*, run the clinical course of cancer; so may epithelioma; but to hence argue that these five forms of growth are essentially the same as scirrhus and encephaloid, is a theory as erroneous, as it is prejudicial to the advancement of practical surgery.

2. *Its Anatomical Structure.*

This, as may be seen at page 115, differs *in toto* from that of cancer.

3. *The absence of any primary Cachexia.*

I do not remember having observed a cachectic state produced, independent of the local effects attending the progress of epithelial tumors.

4. *Its frequently local origin.*

The well-known influence of soot in producing the disease need only be alluded to. Epithelioma not uncommonly takes its origin in warts or corns. Of this latter a good example will be found at page 120.

We have now seen that those arguments which have been adduced as demonstrative of the cancerous nature of epithelioma are so inconclusive, that, when subjected to a closer analysis, they are, to say the least, more apparent than real; that, on the other hand, we have some very decisive and important facts in favor of its non-cancerous nature. My own opinion, then, is that: EPITHELIOMA IS A LOCAL DISEASE, (QUITE DISTINCT FROM CANCER), AND IF IT IS COMPLETELY REMOVED BEFORE ANY

AFFECTION OF THE LYMPHATIC GLANDS, THE PATIENT BECOMES PERMANENTLY CURED.*

The following letter from Professor Hannover, of Copenhagen, is so replete with interest that I have here-with reproduced it *literatim*, affording, as it does, a strong corroboration of my own opinions by one of the most illustrious physiologists and pathologists of the age:—

“Copenhagen, Jan. 19, 1858.

“My dear Sir,— . . . I must first say, generally, that nowhere is epithelioma so malignant as it is in England. In no other country (and I have carefully studied all the museums of Belgium, Paris, and nearly the whole of Germany, on this point) does epithelioma, as far as I know, so frequently terminate in death as in England. I may assert that here, at Copenhagen, where I have, for a series of years, examined nearly every cancerous and epithelial tumor that has been operated upon in the hospitals, it is fatal only in one out of every ten cases; whilst the impression I derived in England was, that there only one out of every ten cases was saved. As far as Denmark is concerned, my opinion is, that cancer is always fatal; that, on the contrary, epithelioma is always curable and eradicable, without endangering the life of the patient. Both these rules meet with very few exceptions in Copenhagen: cancer always returns; epithelioma but exceptionally, and only after incomplete operations, and even the recurrence of epithelioma is *per se* without danger. I am perfectly aware that the experience in England is completely opposed to these facts. I must, more especially, state that affection of the lymphatic glands is at Copenhagen a matter of the most extreme rarity; in England, nearly constant. I look upon this as one of the chief reasons for the malignancy of epithelioma in England. The proximate cause of this difference is not clear to me. . . . I must, in concluding,

* It must be remembered the lymphatic glands may have undergone a partial epithelial infiltration, indistinguishable by any clinical examination: hence an additional argument for operating early in these cases.

say, that epithelioma of the extremities and penis are here excessively rare; I have never seen here a case in the scrotum. . . . The conviction has every day more deeply rooted itself in my mind that cancer and epithelioma must be separated, not merely as *species*, but as *genera*—*i. e.*, when we regard the question in an anatomical point of view: for, when we begin with pathology, we entangle ourselves in a labyrinth of similarities of symptoms, which will never elucidate the true nature of these two completely different diseases.* . . .

“Yours very truly,

“JOHN Z. LAURENCE, Esq.,

“A. HANNOVER.

“30, Devonshire-street, Portland-place, London.”

* I cannot agree with the learned Professor here. Indeed, my chief aim in the present Chapter has been to extricate the pathology of epithelioma from that “labyrinth of similarities” into which it has strayed: how far I have succeeded in the attempt, I leave to my readers to judge.

PLATES.

[The figures in the following Plates have nearly all been drawn from fresh specimens of disease which have from time to time fallen under the Author's observation. Up to the present period he has invariably used a low eye-piece in his microscopic investigations. The fractions ($\frac{1}{4}$ and $\frac{1}{8}$) indicate the focal lengths of the object-glasses employed.]

PLATE I.

All the figures in this Plate are represented, as seen with a $\frac{1}{4}$ -inch object-glass.

The five first Figures show different forms of Cancer-cells.

- FIG. 1.—From Encephaloid of the Humerus.
- FIG. 2.—From Scirrhus of the Breast.
- FIG. 3.—From Encephaloid of the Breast.
- FIG. 4.—From Melanosis of the Eyeball.
- FIG. 5.—From Encephaloid of the Femur.

FIGS. 6 and 7 shew typical Fibroplastic cells.

- FIG. 6.—From some Exudation-matter on the Pleura.
- FIG. 7.—From an Epulis.
- FIG. 8.—Cells from Granulations on Carious bone.
- FIG. 9.—Cells from Encephaloid of the Breast.
- FIG. 10.—Cells from Encephaloid of the Omentum.
- FIG. 11.—Cancer-cells from Carcinoma of the Liver, approaching the characters of Fibroplastic cells.
- FIG. 12.—Cell from Granulations on Carious Bone (same as Fig. 8.), approaching the characters of Cancer-cells.
- FIG. 13.—Cells from Granulations on Carious Bone (another case), more Fibroplastic in character than the last.



Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.

Fig. 7.



Fig. 8.



Fig. 9.



Fig. 10.

Fig. 11.

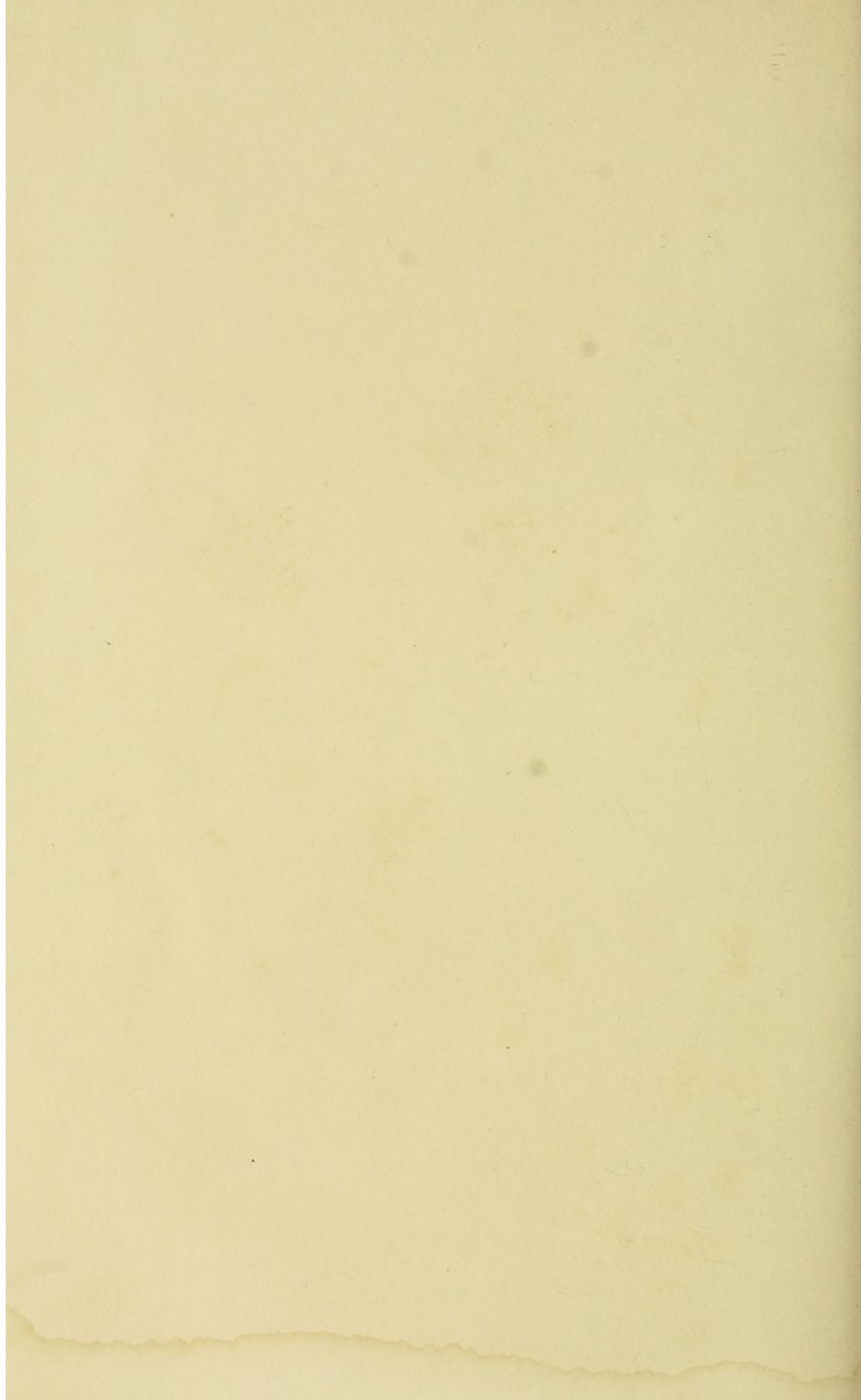


Fig. 12.



Fig. 13.





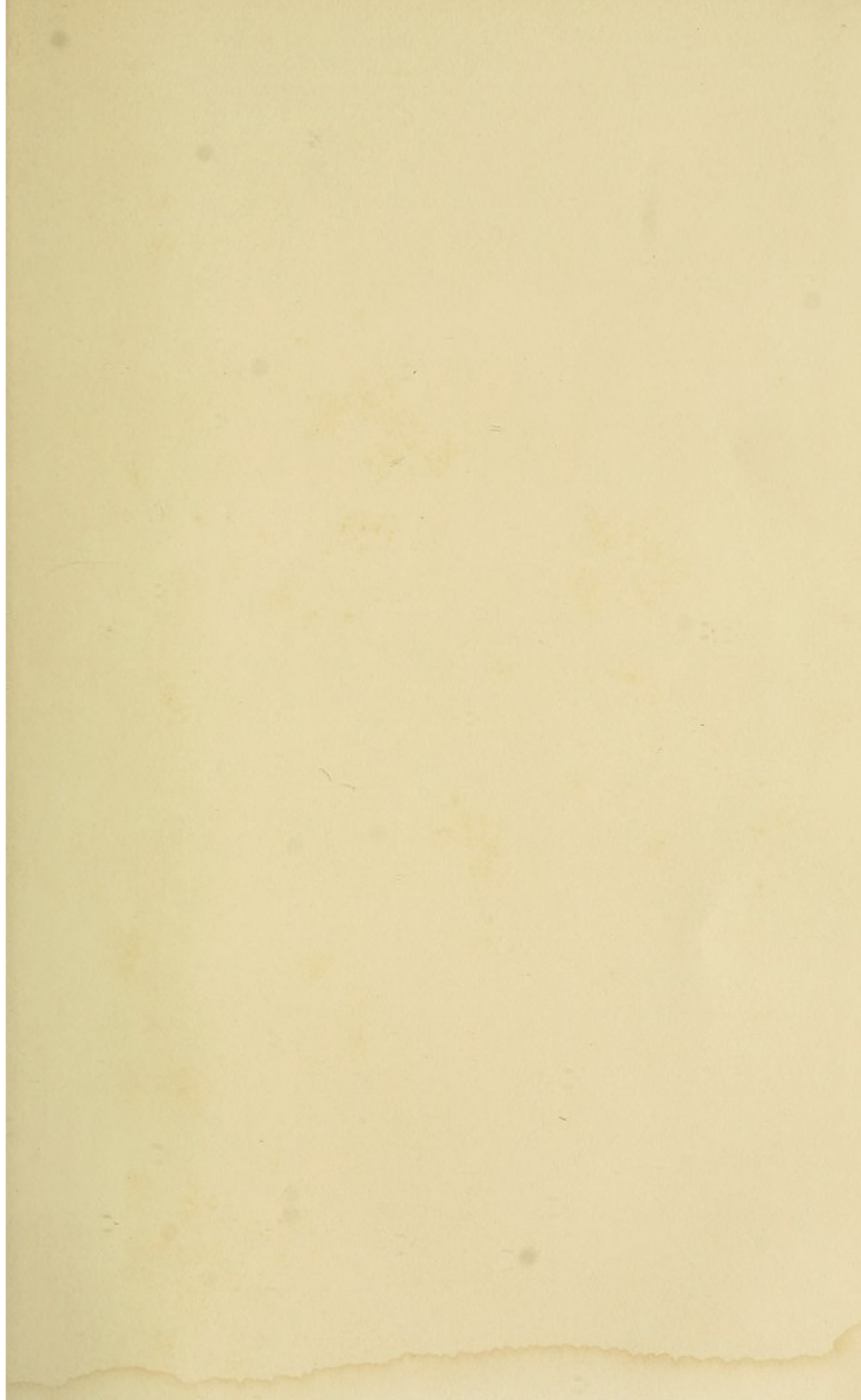




Fig. 1.



Fig. 3.



Fig. 2.



Fig. 4.



Fig. 5.



Fig. 6.

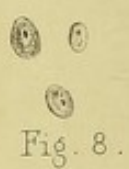


Fig. 8.



Fig. 9.



Fig. 7.



Fig. 11.



Fig. 10.



Fig. 12.



Fig. 13.

PLATE II.

All the figures in this Plate (excepting fig. 13) are represented as seen with a $\frac{1}{4}$ -inch object-glass.

FIG. 1.—Cells from Encephaloid of the Femur.

These figures, taken in conjunction with those of Pl. I., fig. 5, which are from the same case, exhibit a gradual transition of forms from the Cancer-cell to the Fibro-plastic Cell.

FIG. 2.—Cells from another case of Encephaloid of the Femur.

The first in the series is a Cancer-cell; the last five are not distinguishable from Fibroplastic Cells.

In both these last cases, the cancerous nature of the disease was established beyond all doubt, both by the history and the naked-eye characters of the tumors.

FIG. 3.—Cells from Encephaloid of the Breast.

History of the case not decisively cancerous; naked-eye characters of the growth very distinctive. Illustrates, as the preceding case, the transition from the malignant to the non-malignant Cell-forms.

FIG. 4.—Cell-nuclei from a secondary fibroplastic growth in the Liver.

FIG. 5.—Cell-nuclei from a secondary fibrous growth on the Arm of the same subject.

The following Figures illustrate the peculiarities of the minute anatomy of cancerous tumors connected with bone:—

FIGS. 6 to 9 are from a case of Encephaloid of the Femur.

FIGS. 10 to 13 are from a case of Encephaloid of the head of the Tibia.

FIG. 13 viewed under 1-8th object-glass. The explanations of these figures will be best found in the body of the work, at p. 84, *et seq.*

PLATE III.

FIG. 1.—Epithelial cells of the lining membrane of the Ureters of a Fœtus. $\frac{1}{8}$.

FIG. 2.—Cells resembling Cancer-cells from a Glandular Tumor of the Neck. $\frac{1}{8}$.

FIG. 3.—Cells from Osteo-encephaloid of the Lung. Transitions from the Cancer-cell to the Fibro-plastic cell. $\frac{1}{8}$.

FIG. 4¹.—Cells from Encephaloid of the Antrum. Illustrate the same fact as fig. 3. $\frac{1}{8}$.

FIG. 4.—Same as fig. 3. (Engraved twice by an error of the engraver.)

FIG. 5.—Cells and nuclei of a fibro-plastic type from the non-calcified portions of Osteoid Cancer of the Femur. $\frac{1}{8}$.

FIG. 6.—“Nuclear tissue” from the same growth. $\frac{1}{4}$.

FIG. 7.—Fine section of a bony plate from Osteoid Cancer of the Lung. Same case as figs. 5 and 6. $\frac{1}{8}$.

FIG. 8.—Transverse section of the Diaphysis of the Humerus, after Kölliker. To contrast with the preceding figure. $\frac{1}{4}$.

Fig. 1.



Fig. 2.



Fig. 3.

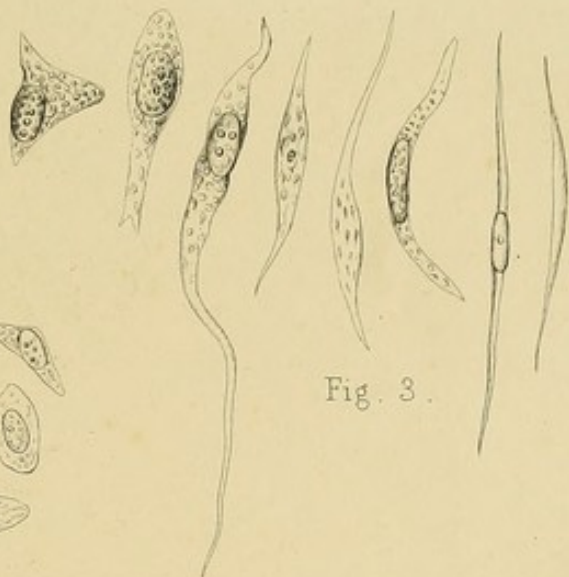


Fig. 4.

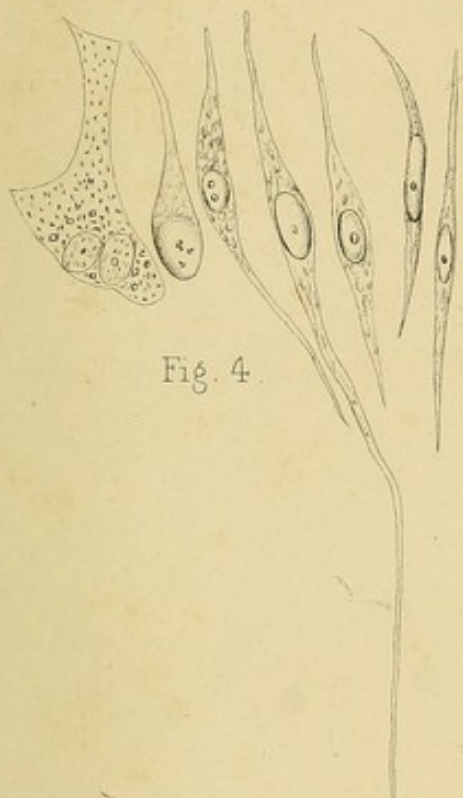


Fig. 4.

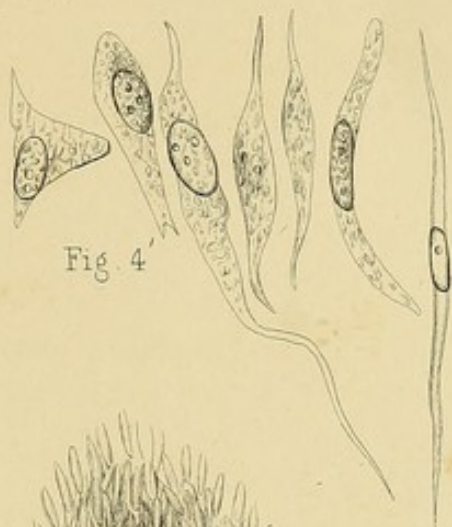


Fig. 6.



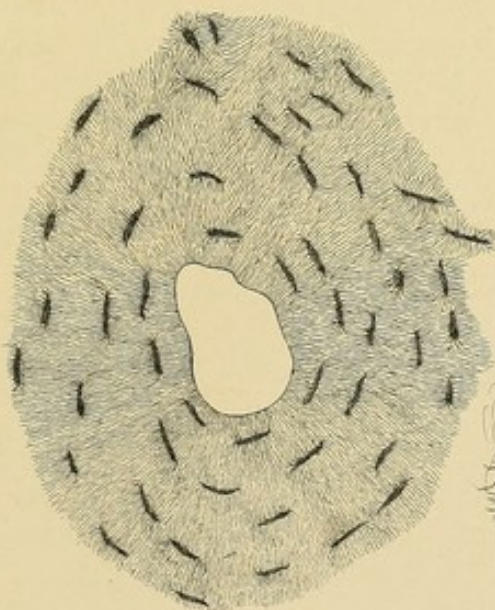
Fig. 5.

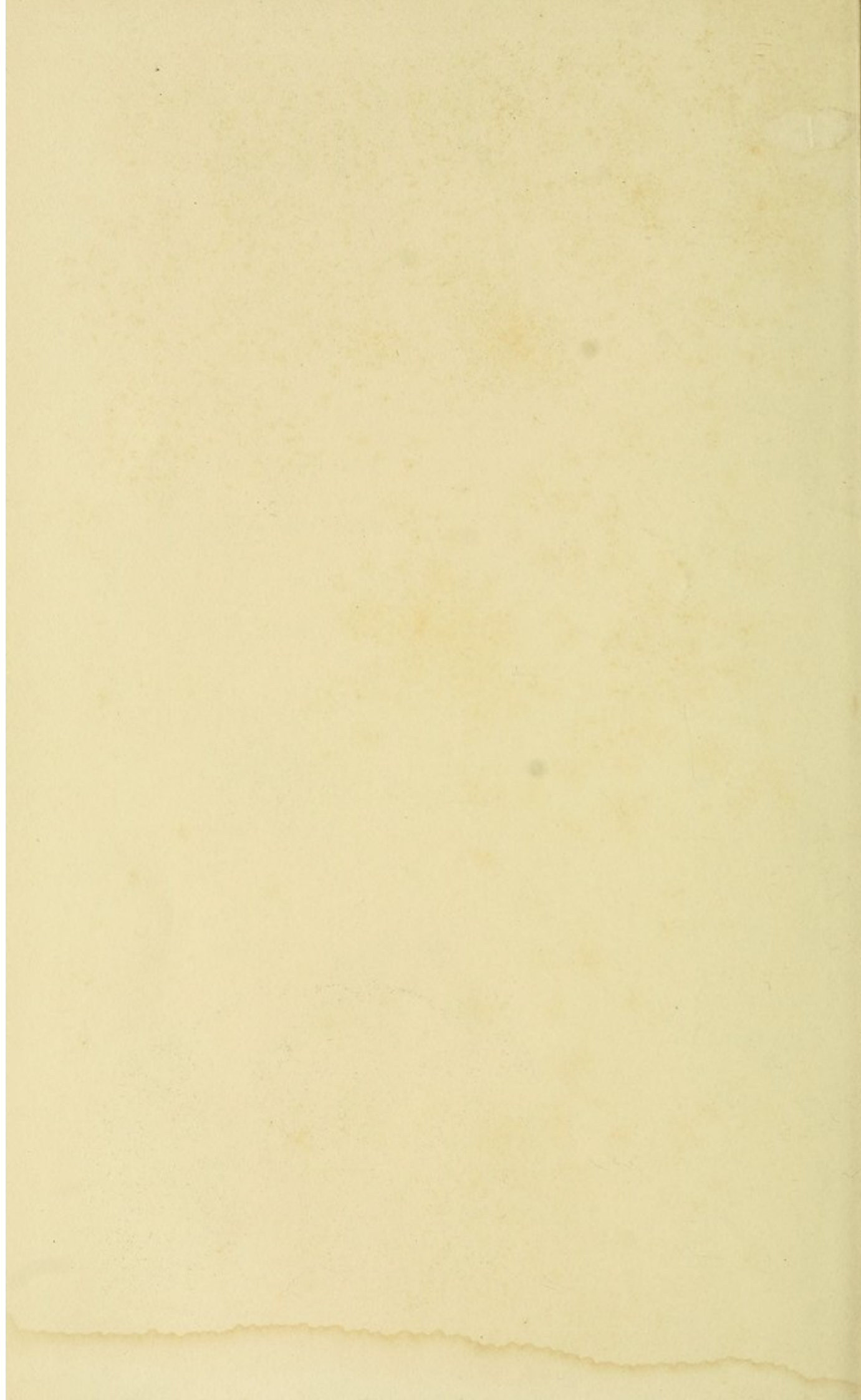


Fig. 7.



Fig. 8.





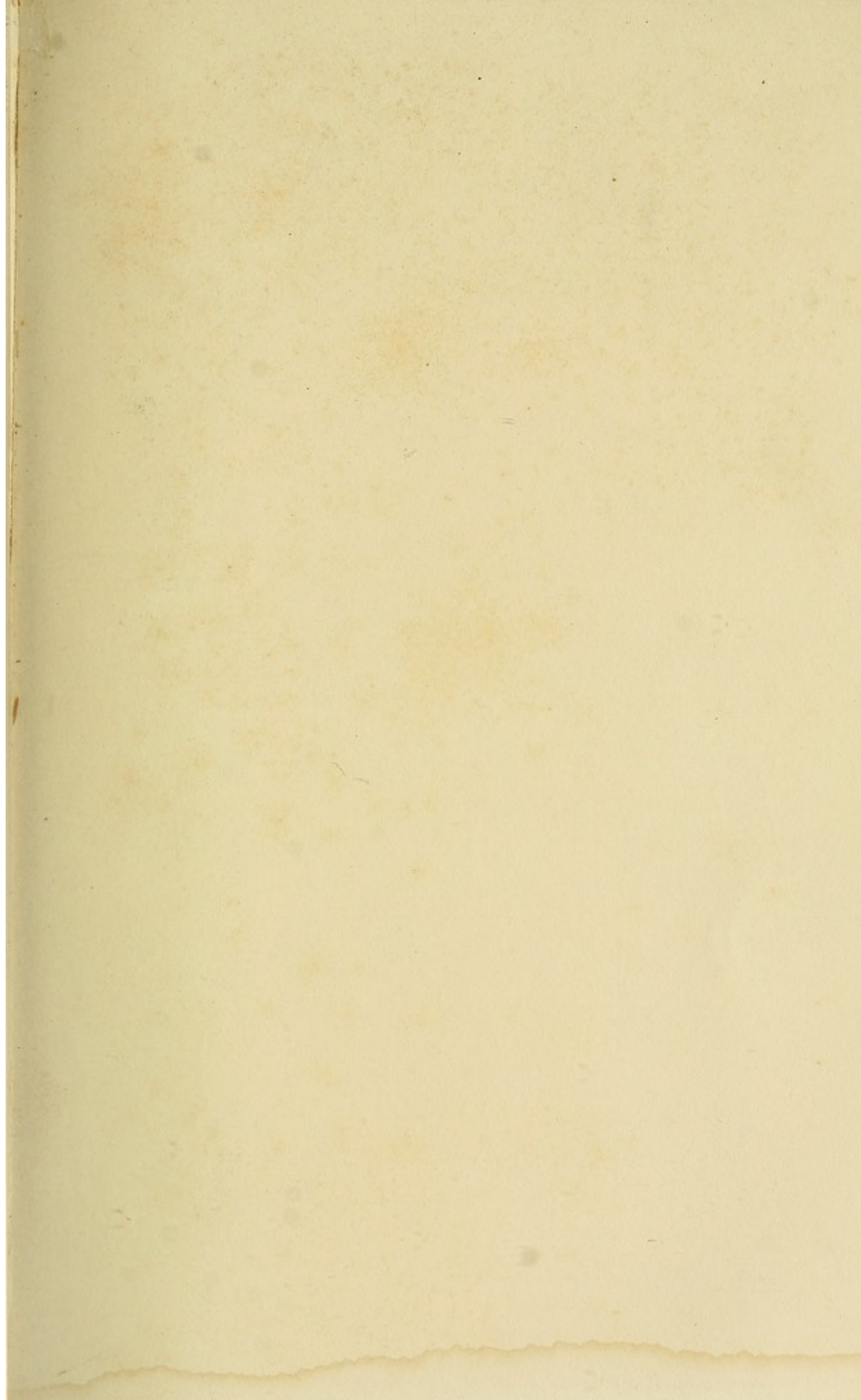


Fig. 1.



Fig. 2.



(a)



Fig. 3.



(b)

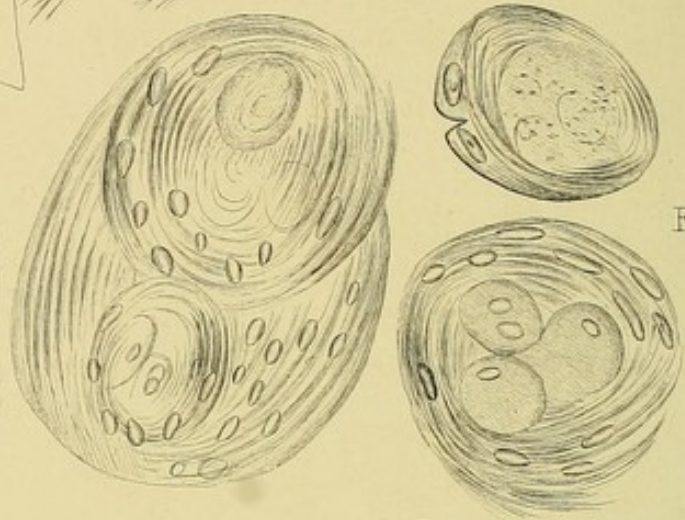


Fig. 5

Fig. 4.

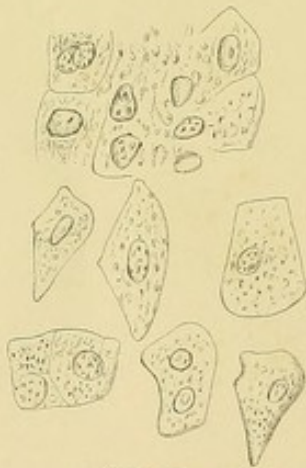


Fig. 6.

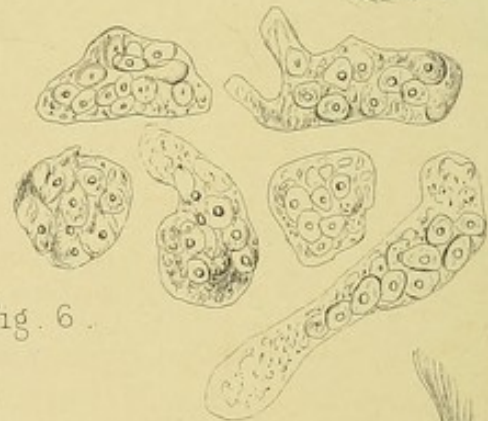


Fig. 7.



Fig. 8.

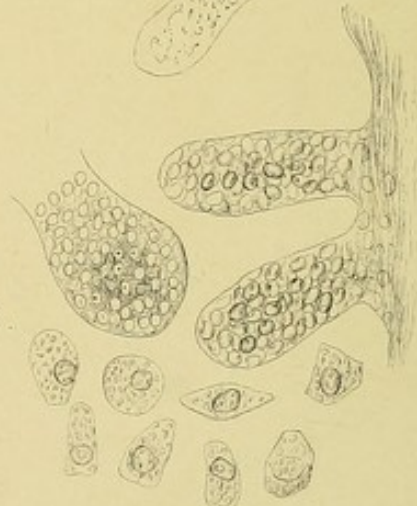


PLATE IV.

FIG. 1.—Fine section of malignant Enchondroma of the Lung. $\frac{1}{4}$.

FIG. 2.—Fine section of Colloid Cancer of the Lung. $\frac{1}{4}$.

FIG. 3.—Fine sections of the cartilaginous portions of a Colloid Cancer of the Thigh. $\frac{1}{4}$.

(a). Resembling foetal cartilage.

(b). Resembling fibro-cartilage.

FIG. 4.—Epithelium-cells from Epithelioma of the Frontal Bone. $\frac{1}{8}$.

FIG. 5.—Laminated Capsules (globes épidermiques) from Epithelioma of the Cheek. $\frac{1}{8}$.

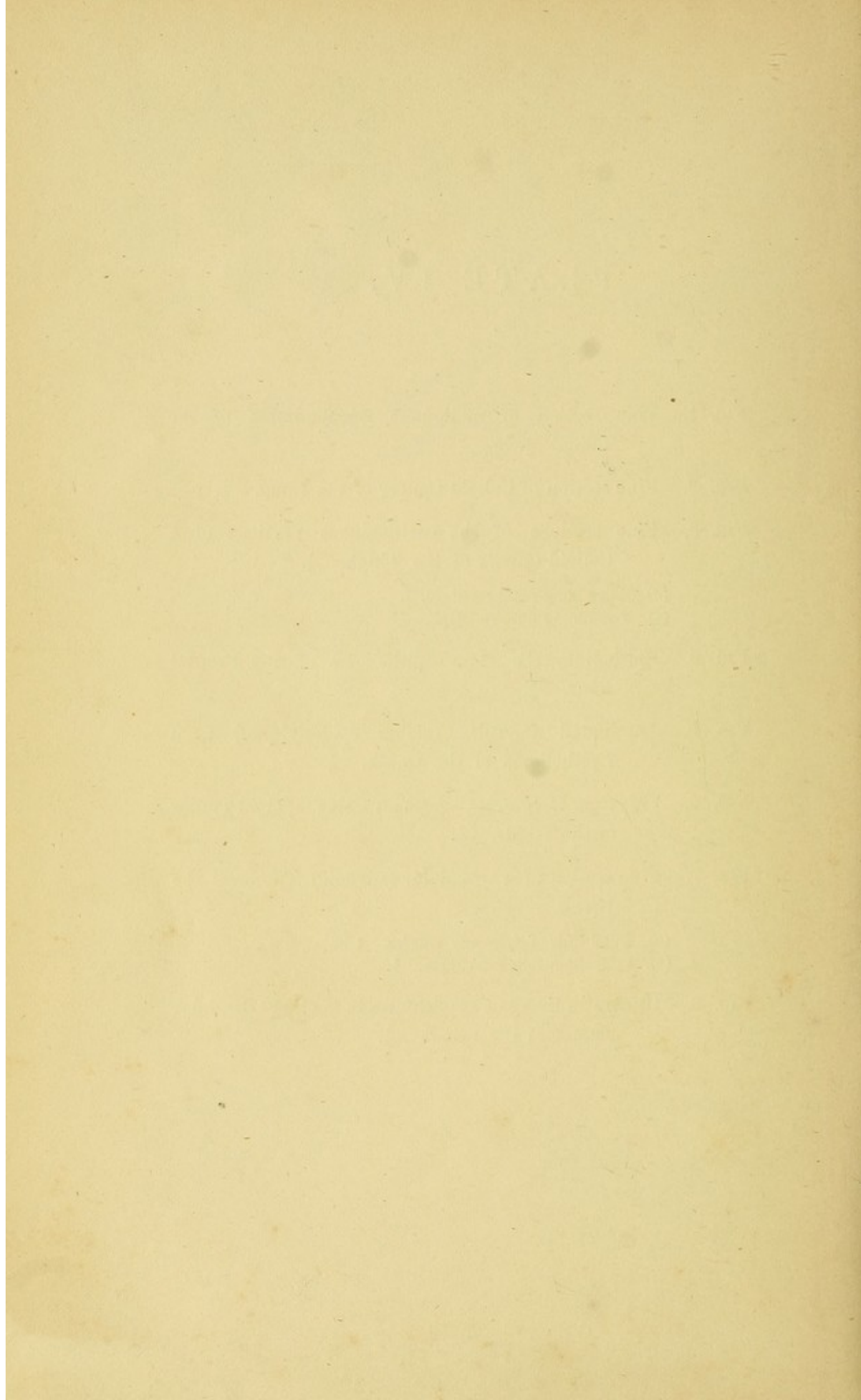
FIG. 6.—“Myeloid Corpuscles,” from an Osteo-myeloid Tumor of the Fibula. $\frac{1}{8}$.

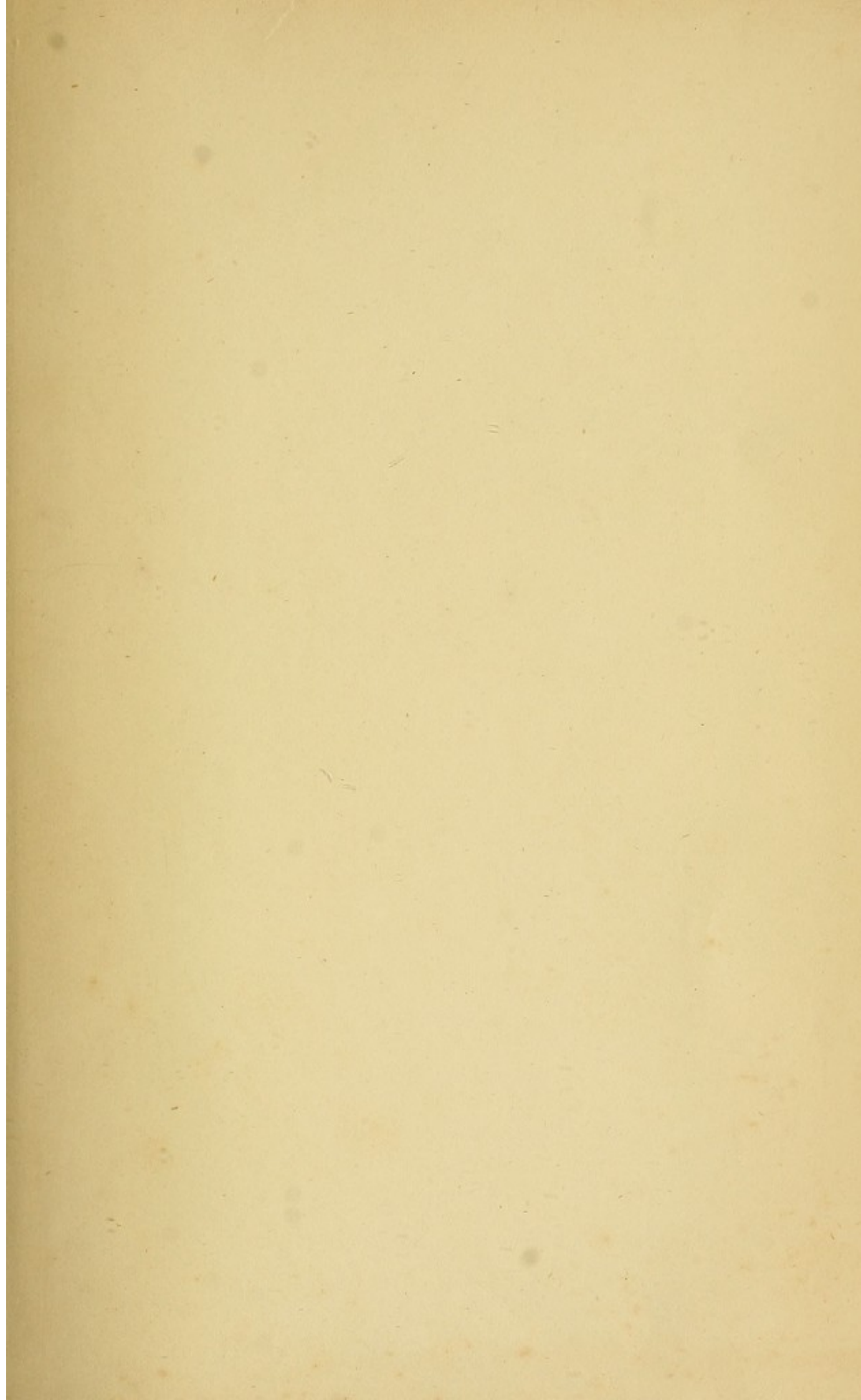
FIG. 7.—Fine section of a Glandular (adenoid) Tumor of the Breast.

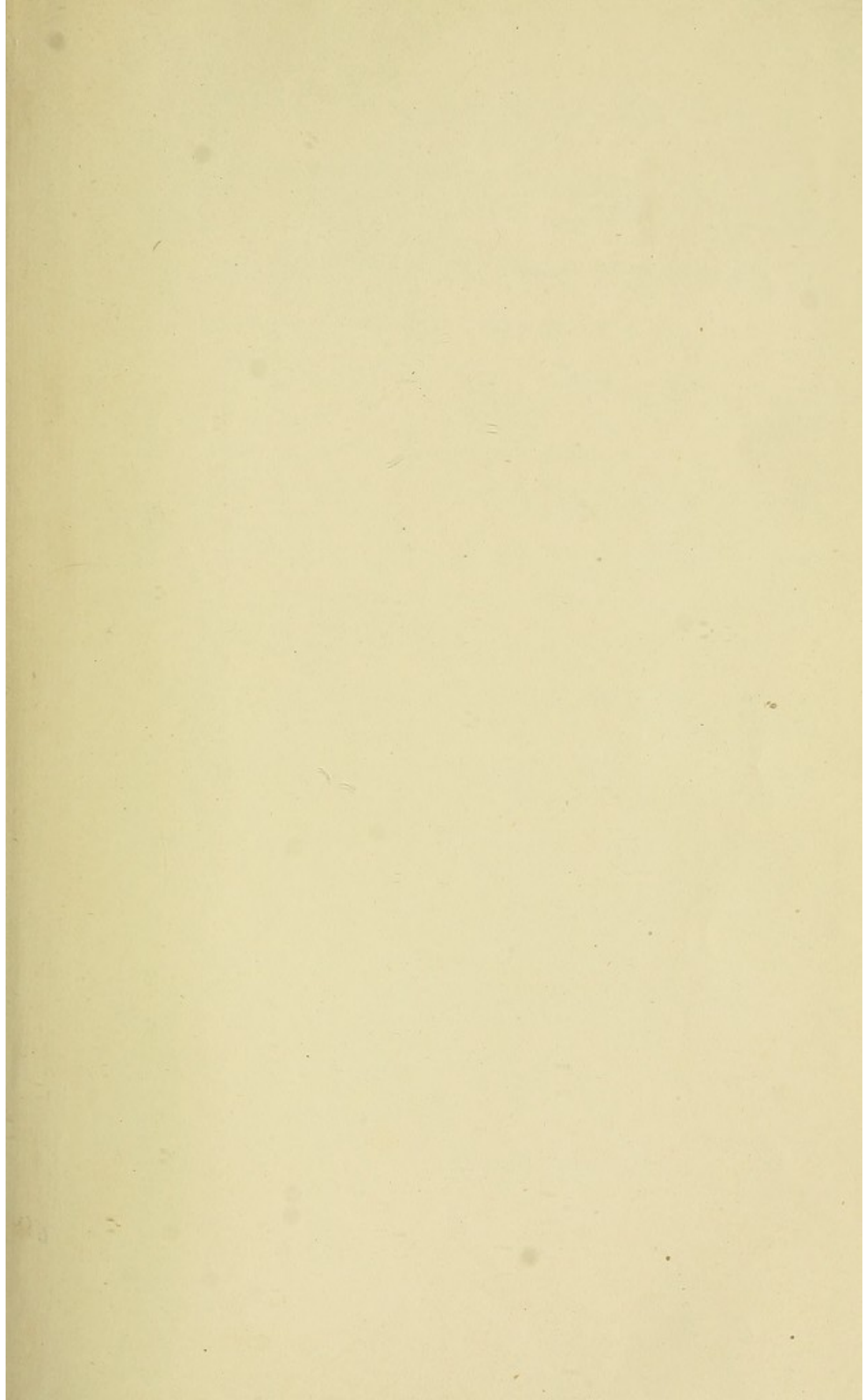
(a). Blind ends of mammary vesicles. 1-in.

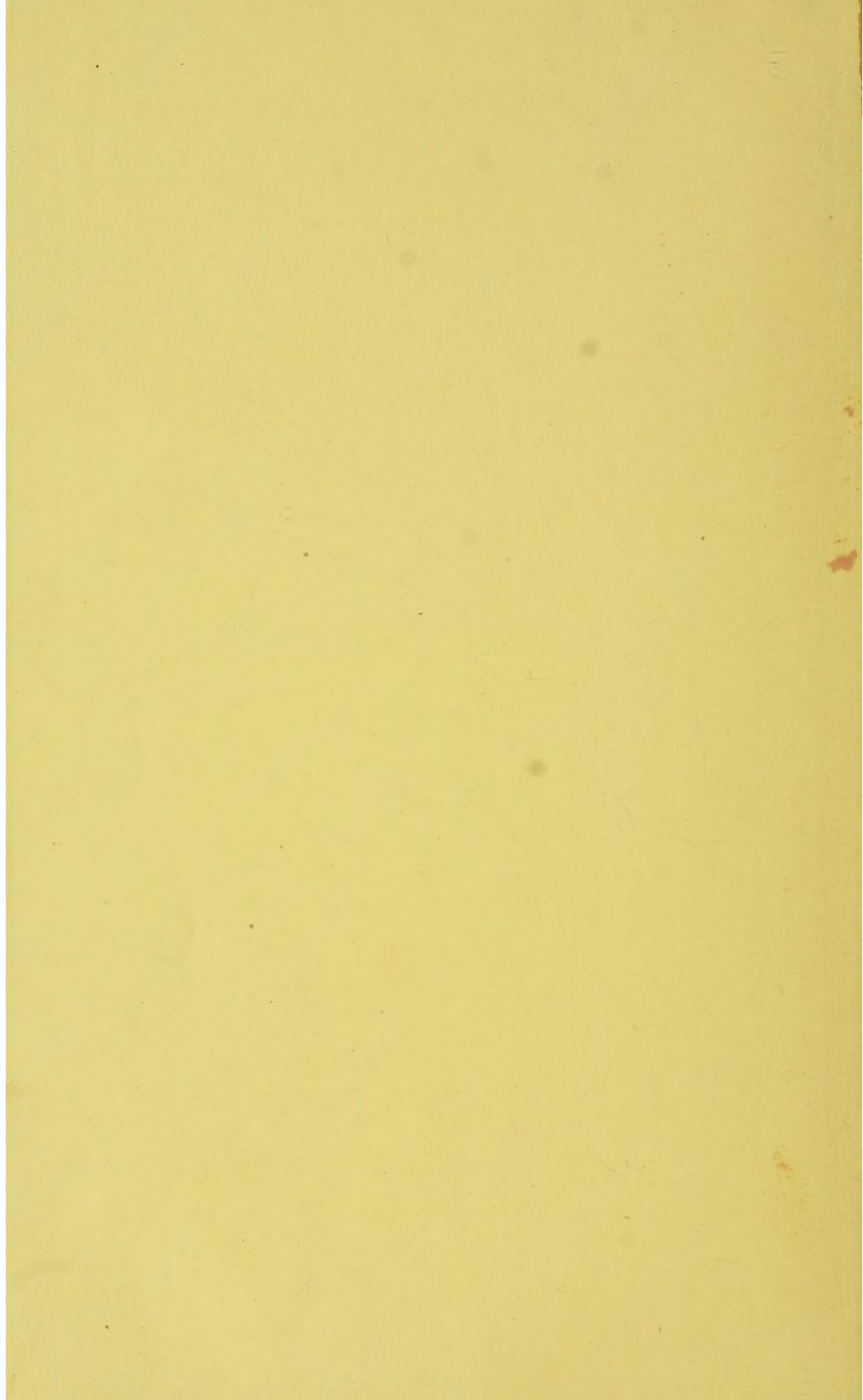
(b). Epithelium-cells from these. $\frac{1}{8}$.

FIG. 8.—Illustrates the same appearances in another Glandular Tumor of the Breast. $\frac{1}{8}$.









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