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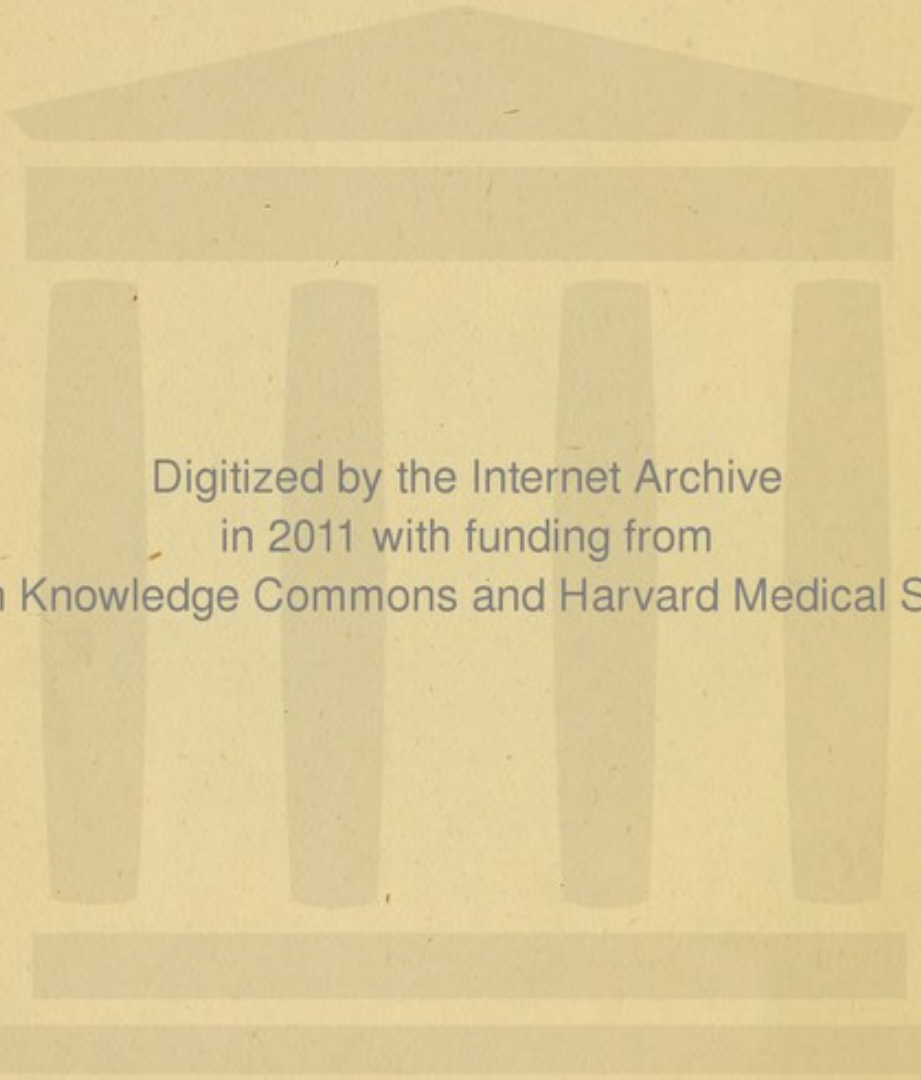

THE

CLASSIFICATION, DIAGNOSIS AND PROGNOSIS

OF

TUMORS,

BRIEFLY DELINEATED FOR PRACTITIONERS.

BY

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FROM THE

DEUTSCHE KLINIK, 1859.

TRANSLATED FROM THE GERMAN BY

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ST. LOUIS, MO.,

PRINTED BY GEORGE KNAPP & CO.,

1861.

THE CLASSIFICATION, DIAGNOSIS AND PROGNOSIS OF TUMORS.

The division of tumors into those which do not recur after extirpation, and those which recur and afterwards invade the general system, is, in this form, totally impracticable and untenable, because it is contrary to observation. If we regard the faculty of recurring as an expression of the importance to the organism which the process producing a tumor possesses, and physicians cling with tenacity to this principle of division, it must be conceded that the above dualism does not exist *in natura*, but that the categories, to correspond to observation, should be more numerous. When Walther, *e. g.*, divided into scirrhus, carcinoma, and encephaloid, all that we are now accustomed to name carcinoma in the aggregate, he had certainly observed more accurately at the bedside than is usually done in later days. Formerly, only experienced surgeons wrote on such matters,—now every young microscopist, who has examined a few bits of tumor, feels justified in talking on the most difficult questions in the doctrine of tumors; the whole subject has been yielded too much to the histologists, and surgeons have retired,—partly, because they allowed themselves to be blinded by the powerful light the new intruders diffused around them. When I repeated in one of my first larger publications, (*Untersuch. ueber die Entwickelung der Blutgefæsse* — Investigations on the development of blood-vessels—1856,) the words of J. Mueller, "the miscroscopical and chemical analysis (of tumors) shall therefore never become the means of clinical diagnosis; it would be ridiculous to wish, or to suppose this possible"—I was repeatedly censured, publicly and privately, and reproached as mistaking the importance of pathological histology. I had appended to J. Mueller's sentence the following remark: "It is my endeavor not only to gain for pathological histology an independent position and a purely anatomical ground, but also to re-install surgery, in regard to the diagnosis of tumors, in its full rights, which it had for a time but too willingly given up." Self-quotations, it is true, have

lately come into great discredit, and I would not, though without fearing criticism, have repeated here my own words, if they did not in some respect represent the programme of my labors in this field. Until now I have published almost exclusively my histological observations, which necessarily extended partly also to normal histology, since most of the general questions cannot be understood and worked out without comparing with pathological forms the normal types. That I do not disrespect pathological histology, as such, must indeed be credited, for else I would certainly not have engaged in it so long; even now I am constantly laboring, as far as is in my power, with new sources and new material, to investigate still further the most detailed views of the structure of pathological new-formations. But however worth knowing the results may be, because the exact cognition of a thing has always in itself a certain value and is productive of gratification to the investigator, they would, nevertheless, be beyond the interests of physicians, almost as much as histology is beyond physiology. Just as the latter sciences are reunited only by the experimental method, so also pathological histology and clinical surgery only meet again in the observations at the bedside. If this parallel was quite correct, we would be in unison with most observers, for all concede that the classification of pseudoplasms must not be left entirely to the histologist, but that the latter must judge new-formations only with the aid of clinical observation, although with the histological structure for a basis; but it is impossible to carry this through, since the above parallel is only partially proper. While for normal histology we can with some degree of consistency maintain the proposition, that *like structure occasions like function*,—that, *e. g.*, we assume as certain the power of contracting wherever we find muscular elements,—the same is not at all applicable to pathological tissues: *tumors, consisting of entirely similar tissues, often have a very different clinical significance.* This result of experience, which is becoming more and more valid, and which it was necessary, at last, to acknowledge, since the decisive position taken by some pseudo-plasmatologists has led us now into this and now into that error,—makes the direct application of histological investigations to the clinical bearings of tumors perfectly unsafe, even if those investigations had ever so much experience for their

basis; and this becomes still more remarkable and evident, when we consider that the examination of the intimate structure of some forms of tumors, especially the soft, depends altogether on the skill and experience of the individual. I will allude only to the fact, that by aid of the new methods of examination, of hardening tissues, etc., we can now gain in many tumors a precise insight into the disposition of the elements that formerly seemed only a chaos of cells, nuclei and molecules.

Shall the physician in his diagnosis be dependent on such histological subtleties? I answer emphatically, no.

But even if we suppose that all difficulties of investigation would gradually be overcome, and histological information had progressed so far that every physician could form a complete anatomical diagnosis of tumors,—the fact, known by experience, that tumors with like forms of tissue can have a totally different clinical significance, would, nevertheless, make the availability of the most arduous investigations very doubtful. Without recurring to the embryon state of histology, which is still found in the modern views of the French, I will only mention that, after the specific cell-form was done away with, the areolar arrangement, for instance, was advanced as the characteristic of carcinoma, so that consequently the enchondromata, which show this very areolar arrangement in the most exquisite manner, were to be counted among cancers,—which was right and was wrong, according to the individual cases. So also the ossifying tumors are of very various clinical importance according to their combinations and their seat, although they all contain osseous tissue. Of similar examples many more might be quoted.

The most various ways have been followed to avoid these contradictions. Some believed, that the mode of development was the chief consideration; this also has proved a fallacy: more recent investigations have shown that the originating points of development of new-formations are nearly always the same, namely, the cells of the connective tissue. Then, they embraced the mode in which the new tissues were inserted into the old; this furnished so far about the best foothold, but could likewise not be carried through consistently. While, in general, carcinomata are intimately connected with the mother-tissues, there are also some that are very accurately limited by a capsule (*abgekapselt*), *e. g.*,

the majority of medullary cancers. Still others abandoned more or less the idea of a thorough general classification, and contemplated every histologically defined form of tumor in regard to its occurrence in different organs and to the clinical experience we have on it. This plan I have hitherto pursued in my lectures; but in the course of time it seemed to me too cumbersome, too complicated, so that I shall abandon it. One may thus, it is true, in advancing the histological principle of classification, also do justice to clinical observation; but this will always come in only second rate, and there lies the mistake. *The histological consideration must combine with the clinical, but the latter must be the leading principle.* Finally, the newest expedient should be mentioned, which Virchow has rather indicated than elaborated, namely, to bring into another form the old distinction of homology and heterology of tissues,—Virchow wishing heterology to be understood as signifying, not, as formerly, the difference of the new-formed tissue from other normal tissues at large, but the difference of the new from the mother-tissue, in which it arose. I confess that I do not perceive the advantage of such a distinction, either in a histological or in a clinical sense; for since all neoplasms arise from connective tissue, all that are not connective-tissue-tumors would have to be classed as heterologous formations. But even without thus drawing the conclusion strictly in accordance with histology, the said distinction would not be satisfactory in itself. Virchow has, however, pointed out a new course in another direction in saying, that the malignity of tumors is a various one, and a certain scale must be adopted for it. This leads to the very point which I intend principally to carry out in the following lines, and for which I could only after prolonged clinical observations adduce complete evidence, namely, that the fault, in respect to the manifold difficulties in the classification, rests not with the histologists, but with the surgeons,—that the clinical division of tumors into benign and malign is incorrect and due to inaccurate observation, as has been already mentioned above. The system of surgery must therefore make certain concessions in this direction, and conform more to accurate observation, on which the anatomical tendency of this age, as a strictly observing school, has, it is true, exerted the most decided influence, that should not be underrated.

When I venture to advance a sort of new classification of pseudoplasms, which shall correspond as far as possible to practical interests, I do so, because I believe I am in possession of a sufficiently ample fund of observations on tumors, at least as far as surgery is concerned, and because I always strove to turn this material to advantage in all directions. The prognostic principle of classification, which hitherto was familiar to physicians—the faculty of recurrence in variable degree and extent—I regard as perfectly competent for practical purposes, and therefore retain it in the main. In the designation of the various forms of tumors I have likewise altered nothing and retained the usual names, but eliminated those names, which were chosen according to microscopical elements; they may be reserved to histologists for the more minute distinctions. The consistency and the similarity to normal forms have occasioned the most current names, and it would be a vain endeavor to substitute other denominations for them; the majority have been chosen very pertinently by our forefathers. On the whole, I pay especial regard in this classification to the requirements of the educated physician. The delineations of the characteristic marks of the various forms of tumors are therefore but short, and look principally towards the prognosis; *they all have reference to cases which I have observed myself*, so that I am able to bear out every remark that may appear new, with examples. For the histologist only here and there a few points could be thrown in. Whoever has examined many tumors, will agree with me, that, *in most cases*, one can predict from the mere accurate inspection of the tumor with the naked eye, how it is constituted microscopically; but there are in this respect many exceptions that may deceive the most expert, since the multiplicity of minutest forms is especially astonishing in tumors.

I. TUMORS WHICH BUT SELDOM RETURN AFTER EXTIRPATION, BUT SOMETIMES OCCUR DISTRIBUTED IN GREAT NUMBERS OVER THE WHOLE SURFACE OF THE BODY.

1. *Simple Cysts.*—We distinguish most advantageously after the old mode four species of them, namely, according to their contents: (*a*) *Cysts with serous fluid.* They are rare, usually occur single, and do not return after the extirpation of the sack;

they arise on the spermatic cord, on the neck, especially close by the thyroid, seldom in the ovary, in the broad ligaments of the uterus, and are usually curable by injection of iodine, if this can be made.

(*b*) *Cysts with mucous contents*, (*colloid cysts*,) *of wine or honey-like, yellowish or brownish color*, (*Meliceris*). These mucous contents are not always purely a secretion of the walls, but often constitute a very soft tissue, (*mucous tissue*, *Schleimgewebe*,) the consistence of which can condense to that of a jelly. These cysts are found on the neck, under the tongue (as ranula), in the thyroid gland, in the ovary, seldom in the mammary gland; they frequently occur in great numbers in one organ, *e. g.*, in the ovary and thyroid gland. The injection of tinct. of iodine is with these an unreliable remedy; sometimes it is efficacious when repeated, but it may also lead to violent inflammation and ulceration if the soft remnants of tissue are suffered partially to remain. By extirpation of the sack with the diseased organ these tumors are curable; they do not invade other parts of the body.

(*c*) *Cysts with pultaceous, fatty contents.* The latter vary greatly in regard to color and consistence; they may be grit-like, semifluid, with many glistening cholesterine tablets, (Atheroma, Grit-follicle — *Gruetzbeutel*); occurring often in great numbers especially on the head, sometimes undoubtedly in connection with general lesions of secretion in the sebaceous glands; in other cases, the contents are yellowish-white, firm, consisting of concentric laminæ, (lamellated cholesteatoma, pearly tumor,) also occurring on the scalp, and likewise on the *basis cranii;* finally, the contents may be snow-white, fluid like beaten cream, sometimes emulsion-like, similar to pus; such cysts occur principally in bones, (especially the frontal and temporal,) but also in the ovary, on the neck, and here not unfrequently arising from the sheaths of vessels. Their walls sometimes present on their internal surface a cutis-like construction; a *rete Malpighii*, hairs, sebaceous and sudoriferous glands, (dermoid cysts;) in the ovary there may be found in them, besides, pieces of bone, teeth, and the like. These cysts are seldom curable by injections of iodine; I am, so far, acquainted with only one case on the neck, where the fluid was puriform, and proved to be a fatty emulsion with

epidermic plates and cholesterine, in which a cure was effected by two injections of iodine; rapidly and with certainty this end is attained only by extirpating the sacks, provided that this can be done without danger to life.

(*d*) *Cysts with blood* are very rare; they are liable to occur on the most various parts of the body, (neck, axilla, chest, thigh;) their origin is unknown. Extravasations, of course, are here not included.

2. *Fatty tumors*, (*Lipomata.*)—They are frequent, occur almost exclusively in the subcutaneous cellular tissue, but may also originate in the fasciæ. They may be divided in two ways: first may be distinguished the *circumscript* and the *diffuse* form. That form, which is *definitely limited against the surrounding parts by a sort of connective tissue capsule*, is frequent on the neck, back, abdominal walls, and these tumors attain an enormous size; sometimes they ulcerate superficially; their construction is usually lobular; calcifications and even partially true ossifications may take place in them, and then the adipose tissue of some lobes is transformed into an emulsive or purely oily fluid; this is however a rare metamorphosis; commonly they remain, consisting uniformly throughout of adipose tissue; the latter varies in color and consistence, inasmuch as lipomata may look white as lard, but in most cases appear yellow, soft and lobular, like the common fat of man. When these tumors are carefully extirpated they do not return. But hundreds of them may form on the body simultaneously.

The *diffuse* form of lipomata is much less frequent; it proceeds from a hyperplasy* of the subcutaneous cellular tissue, and occurs congenital on the extremities and in the face, but may also be developed at a later period; the superfluous tissue can here be removed only by elliptical excisions, and the disease cannot always be remedied entirely by the operation; sometimes, however, the formation of fat will come to a stand-still after some of it has been removed. The *Lipoma arborescens* of J. Mueller occurs in joints and in the sheaths of tendons; it is an exuberant production of fat in the synovial villi (analogous to the *appendices epiploicæ*), and seldom has the import of a pseudo-

* Increased development, multiplication of the elements, formerly comprised under the general name of hypertrophy.—Tr.

plastic process; no case has yet occurred to me that was of any surgical importance.

The lipomata are also subdivided in another direction, namely, into *simple* aud *compound;* the latter are combinations of adipose tissue with others. Among them is especially to be mentioned the combination with firm fibrous masses, the *fibrous lipoma;* it is rare, occurs in young individuals, proceeding from fasciæ (dorsal fascia, inguinal ring, hand), and is usually a tumor that extends by many branches and lobes between muscles and tendons, is difficult to extirpate entirely, and therefore liable to return. In the other combinations of the lipoma (with soft connective tissue, mucous tissue, medullary mass, cavernous angiectasia), the adipose tissue exists always in less quantity than the other resp. tissue, and the latter determines the importance of these combined tumors.

3. *Fibrous tumors.*—Of these, two different kinds must be distinguished:

(*a*) *The soft fibrous tumor* (*connective-tissue-tumor*); it is purely white, tough as thick cutis, and occurs also congenital as hypertrophy of the skin, either as a thick protuberance (*e. g.*, on the cheeks, lips), or as a pedunculated tumor, (*Molluscum simplex*, *Dermatolysis*, *Cutis pendula*,) sometimes expanded in great masses over the whole body, and in the face, mostly on one side only, as vegetations resembling the comb of a cock; it combines with brownish coloration of the skin, excessive development of hair, and with capillary ectasis and the production of fat. If these tumors are developed at a later period, they appear more especially on the labia pudendi as pedunculated, lobate tumors, mostly a long time concealed, and hence very large (sometimes termed Elephantiasis); they do not return after extirpation.

(*b*) *The hard fibrous tumors*, *fibroid tumors*, *desmoid tumors*, are, as is notorious, most frequent in the uterus; their structure is in general well known, although it is by no means very clear, whereon is based the peculiar arrangement of the fibres, so very conspicuous on the surface of a cut, and the variegated gloss. The connective tissue, here firmly interwoven, is of a peculiarly rigid, brittle texture. Considering, first, the fibroid tumors of the uterus, we find in them ordinarily a large amount of organic muscular fibres, sometimes extensive calcification,

rarely ossification of the tissue. The form in which these tumors appear, is either round, knotty, for the most part accurately limited; and in these cases the fibroid growths become more or less pedunculated, projecting into the abdominal cavity or into the vagina, according as they are developed in the fundus or in the cervix; or they are less circumscript, more interstitial, partly protruding out of tho os; the latter form is rare, sometimes consists of organic muscular fibres, and is separable into bundles in different directions. Considering the difficulty of removing radically those fibrous tumors of the uterus capable of operation, it is not astonishing that local relapses occur.

On fasciæ, and on the periosteum also, pure fibroid tumors are not unfrequent; they are remarkable for their enormously firm adherence to the surrounding soft parts, not seldom send a number of knotted branches into the neighboring parts, and are therefore sometimes exceedingly difficult to extirpate. The periosteum of the tibia is a favorite seat of these tumors, and here they are not unfrequently painful; from the periosteum of the clavicle, also, I saw two fibroid tumors extirpated; in these localities they often partially ossify. The fasciæ of the thigh, abdominal walls and back, sometimes produce fibroids too. This form of fibrous tumor may further appear as fibrous nasal or naso-pharyngeal polypi; in bones it is rare. I saw it only in the upper maxilla,—still rarer in glands, *e. g.*, in the mamma; but more frequent again on nerve trunks as neuromata.

Fibroid tumors destroy bones by pressure, when they are near them, and thus become dangerous, *e. g.*, when, as fibrous polypi of the pharynx, they grow upwards and perforate the *basis cranii*. The principal danger of these tumors lies in hemorrhages; a tendency to superficial ulceration with the firmly attached skin is peculiar to them; from these apparently trifling wounds arterial hemorrhages of such violence may take place as to leave the patient almost anæmic; this is equally true of fibrous polypi of the uterus, nasal polypi, fibroid tumors of the fasciæ and of the periosteum. The tumors are extraordinarily destitute of capillary blood-vessels, but contain quite a number of small arteries; these have no distinct external tunic, the latter being merged in the fibroid tissue; when, therefore, a small artery is corroded, the rigid orifice remains open, because the vessel cannot retract;

in this manner I would explain the paradox, that the tumors most devoid of blood can bleed most profusely.

No well authenticated case is known to me of pure fibroid tumors returning after radical operation, and extending over the body in general. The cases of Paget I cannot recognize as pure fibroid tumors; they are combinations with sarcoma; for fibroid tumors can combine with different forms of sarcoma and then assume a totally different character. I observed a fibroid tumor of the upper jaw, which was combined with mucous tissue and returned three times after extirpation; in other cases, combinations with various other forms of sarcomatous tissue occur, and in accordance with the character of the latter must the prognosis be determined. In many fibrous tumors, (in those of the uterus also,) small fissure-like cysts are found, which, however, are without practical importance, and in regard to which histological researches are wanting. Not unfrequent seems to be the combination of the cavernous hæmatoma with the fibroid tumor; I am acquainted with examples of uterine and pharyngeal polypi that presented this combination.

4. *Pure cartilaginous tumors*, *Enchondromata*, are situated most frequently on the phalanges of the hand and on the metacarpal bones, seldom in the bones of the face; they grow very slowly, without pain, and cause, on account of their firm consistence, seemingly no lesion of continuity in these small bones and therefore come to the notice of surgeons usually but very late in persons of middle age, although they originate in youth; nearly always there are several tumors at the same time, and ordinarily these originate in the periphery of the diaphysis of bones. I have never observed that an enchondroma expanded the cortical substance of long bones, like a bladder, although isolated patches of enchondroma may arise in the very centre of the medullary substance; these tumors, on the contrary, usually grow completely through the bone. If they become very large, they may ossify more or less; but the bone-substance thus formed is a very irregular one, partly rather a calcification of cartilage, and has a strong tendency to necrose, especially if the tumor begins to ulcerate from without inwards. In men, the production of enchondromata appears to be more frequent than in women. Although these tumors occur on one or both hands at the same time,

in large numbers, yet after the exarticulation of the affected fingers local relapses do not take place; but in recent times a more general development of enchondromata, especially in the lungs, has indeed been repeatedly observed.

Enchondromata may also present themselves in the form of cystoid and colloid tumors, and then have an entirely different clinical cnaracter, whereof more shall be said in the second group. (See below.) Sometimes, too, the formation of cartilage combines in the salivary glands with glandular tumors, and in the testicles not seldom with medullary forms; the latter, however, then determine the surgical importance.

5. *Exostoses* occur only on bones, and are distinguished from osteophytes and callus, just as tumors in general are distinguished from chronic indurations and cicatrices. Osteophytes are produced in consequence of chronic periostitis, and are to a certain degree capable of resorption; the callus of fractures, particularly, can in the course of time considerably diminish (which can be observed especially well in fractures of the clavicle in children).

Exostoses are usually pretty circumscript osseous tumors, and are never resorbed. There are two species of them:

(*a*) *The spongy exostosis, lined with cartilage—exostosis cartilaginea, ecchondrosis*—is developed only at the juncture of epiphyses and diaphyses in individuals under twenty-four years, *i. e.*, at the time when the diaphyses are still separated from the epiphyses by a band of cartilage; the latter probably grows primarily, and gradually ossifies. The tibia, fibula, and humerus, are preferred by these tumors; the spongy bone-substance (of the tumor—*Tr.*) well supplied with blood, is intimately connected with the same substance of the upper or lower end of the affected bone; a thick perichondrium is easily removed from the superficially overlying stratum of cartilage, 1—1½ lines (.09—.13 inches—*Tr.*) thick; hence these exostoses are easily laid bare to the bone; because of the proximity of joints, these tumors sometimes cannot be extirpated without danger; in such cases the operation should never be pushed to the opening of the capsular ligament; according to Syme's observations, these exostoses are said to cease growing after the completion of the skeleton.

(*b*) *The ivory exostosis* also occurs in young individuals; it has neither a special covering of periosteum nor of cartilage, is

uneven, rough on the surface, and has its seat preëminently on the bones of the face and cranium, and on the scapula; on the whole it is very rare.

Exostoses do not return locally after the resection of the tumor from the bone; several tumors may be present simultaneously, but this also happens very seldom.

6. *Vascular tumors, Angioplasmata.*—Aneurisms and varices in their various forms are not, usually, included among pseudoplasms, and are described in connection with the diseases of arteries and veins. Only the dilatation of capillaries, and of the smaller veins and arteries approximating them, are here counted in as so-called *telangiectases*, *erectile tumors*, *fungi hæmatodes*. We must distinguish two kinds of them:

(*a*) *The telangiectasis* with its prolific development of vessels is the commonest form; it occurs nearly always congenital, is of pretty rapid growth in extent and depth, and consists of dilated, and for the most part new-formed, capillary and intermediate* vessels. These telangiectases may present a very different appearance according as the vascular disease has its seat: (1) superficially in the vessels of the papillæ; then a cherry-red spot, scarcely elevated above the skin, is produced, which gradually expands—or we see in the skin with the naked eye a multitude of little red blood-vessels that apparently have no (mutual) connection, or in other cases appear as peripheric processes of a red spot; (2) deeper in the cutis or in the subcutaneous cellular tissue; then arises a soft elastic tumor, usually of a steel-blue color; when extirpated, it collapses considerably and presents itself as a light-reddish lobular mass, which may often penetrate deep into the fat and even into the muscles. These two varieties not unfrequently combine, and then cherry-red tumors are formed that consist entirely of vessels, and in which all parts of the skin are uniformly affected by the vascular ectasis and prolification. The safest and simplest mode of destroying the superficial forms of these tumors is by nitric acid; massy tumors of this kind are excised, or, if the hemorrhage is thought not to be easy to arrest, ligated or removed by the galvano-caustic ligature; the two last named methods, however, are not as safe as the extirpation, be-

* Intermediate between capillaries and arteries or veins; literally translated, "transition vessels."—Tr.

cause in them one cannot precisely determine whether all diseased parts have been removed; small portions remaining always give rise to local relapses. Telangiectases occur only in the skin, and, by spreading, in the superficial muscles, often simultaneously in large number, but when well extirpated they do not return, and such tumors are never developed secondarily in internal organs.

(*b*) *The cavernous hæmatoma*, cavernous ectasis of veins; this resembles, on a section, the *corpus cavernosum penis*, and has, indeed, nearly the same structure; after the extirpation all blood has escaped, and a coarser or finer, much contracted network of meshes is seen with the naked eye, in which some coagula of blood or sometimes also small phlebolithes are found. (Perfectly analogous to these formations is the *cavernous lymphatic tumor*, in which the corresponding network is filled with a lymphatic fluid; this tumor occurs in the tongue and lips as *macroglossia* and *macrochilia congenita*.) The cavernous tumors of veins present themselves in various forms: (A) they are tumors strictly enclosed in a capsule, and are connected very intimately with larger veins, *e. g.*, on the forearm; (B) they have definite limits, but are fed only by very small venous and arterial branches, as, for instance, most tumors of this sort in the liver; (C) they are without perceptible limits, and extend by a multitude of fine processes far around in the subcutaneous cellular tissue; these are sometimes joined again by varicose veins, and thus a limit is often not to be found at all during the operation, especially since the tissue cannot be discovered after the escape of the blood, because it collapses so much that it cannot be distinguished from the subcutaneous tissue; (D) they combine in the subcutaneous cellular tissue with fibroid tissue, with circumscript and diffuse lipoma, in the skin with warty formations. The minuter relations in the development of these tumors are not yet explained. It is usually assumed that the small veins dilate and their approximated walls are resorbed; many cases speak in favor of this view, in which dilatations of veins exist in the vicinity of cavernous tumors, and likewise the manner in which these tumors are developed in bone; in many other instances, however, the evidence for this mode of development is wanting, and investigations in this direction should still be continued. Sometimes the cavernous tumors, also, are congenital, but in general this is very rare;

mostly they occur without a known cause in young individuals, often scattered over several parts of the body at the same time in great number. They grow slowly, but gradually metamorphose all adjoining parts into cavernous tissue; the skin covering them is either unaltered and normal, or colored steel-blue by the venous blood shining through it; the tumors are now larger, now smaller; sometimes exceedingly painful on the slightest touch, and always present distinct fluctuation unless they are combined with other tissues. When they are extirpated, they collapse at least to the fourth part of their volume, the swelling being based only on the contents of blood. Wholly extirpated they do not return, but the complete extirpation is sometimes very difficult, often impossible. Left to itself the cavernous phlebectasis attains an enormous degree of development, and may, since it not seldom occurs in the face and on the skull, become fatal by destroying the cranial bones; at the same time cavernous tumors may then form in internal organs also—in the liver, spleen, kidneys. In the liver, these tumors not unfrequently appear primarily, but never attain such a size as to become capable of being felt from without and of being diagnosticated; they partly destroy the parenchyma of the liver without creating any material disturbances in the hepatic function. For the first admirable investigations on cavernous tumors we are indebted to *Rokitansky*.

The *naevus telangiectodes*, *mole*, (*Feuermaal*,) has about the same character as the telangiectasis, except that the dilatation of the capillary loops of the papillæ, in particular, is considerable; it is always congenital and has no individual growth, increasing only relatively with the growth of the corresponding portion of skin.

7. *Horny excrescences* are thickenings of the horny part of the epidermis with participation, at the same time, of the papillary body of the skin. In *callosities* and *corns*, the excessive formation of epidermis is the principal change, as likewise in the *cutaneous horns*, which may besides arise from the walls of atheromata; in *warts*, the hypertrophy of the cutaneous papillæ is more prominent, and also in the verrucose excrescences which form on the skin with contemporaneous elephantiasis. Warts occur especially on the hands of children, sometimes in enormous numbers, but not unfrequently recede

spontaneously. The warts of the lower lip are rare, their horny epithelium is softer than that of the cutis; so long as the degeneration is confined to the papillæ, they are not dangerous; these tumors are the ones *originally* designated as *cancroid* tumors; they do not return after complete extirpation; but if, by repeated irritation of the wart. The process of hypertrophy extends upon the neighboring parts, an epithelial cancer may be developed from the wart. The name of cancroid tumor has now been so completely transferred to the epithelial cancers, that the latter are all designated as cancroid; we shall recur to this in the paragraph on carcinoma (in the 3d group).

II. TUMORS WHICH OFTEN RETURN LOCALLY, BUT SELDOM INVADE INTERNAL ORGANS.

1. *Gland-like tumors, Adenoids, partial hypertrophy of glands.*—They originally derived their name from their gland-like appearance, and occur almost exclusively in the mamma. Their importance always depends on the nature of that new-formed tissue, which binds the acini together. Hypertrophy of the gland, in itself, is not applicable to the prognosis; it combines with the most various forms of tissue. A true new-formation of glandular substance, however, occurs preëminently only in simple tubular and racemose glands, and combines most frequently with a jelly-like connective tissue; these productions form the so-called *mucous polypi* in different degrees of organization, in general always analogous to the mucous membrane from which they arise, and are therefore to be considered as a lobular, polypous hypertrophy of mucous membranes; they are most frequent on the mucous membranes of the nose, rectum and uterus; from the acini of mucous glands contained in them, mucous cysts of greater or less size may be developed (*cystic polypi*). Inasmuch as a morbid disposition of the entire mucous membrane prevails in the development of these mucous polypi, it is not unfrequent that soon after the extirpation of one tumor another is formed, not considering even that the radical extirpation of these polypi can hardly be accomplished with certainty. A luxuriance of sudoriparous and sebaceous glands also occurs, but is certainly very rare; I have never observed it. Hypertrophy of compound tubular glands (testicles, kidneys) has, up to this

time, not been demonstrated with certainty. Among the compound acinous glands, the mamma is the only one where not only an independent excessive growth of one or both glands occurs, but individual lobules also can become hypertrophic, although with abnormal interstitial substance. (In this, I follow the hitherto generally received opinion, while according to my own observations a new-formation of acini does *not* occur in these tumors.) We have here especially to speak of the *adenoid tumors*. In their purest form they *about* resemble the gland during lactation; but this comparison, too, is only approximately correct, because the smallest lobules are never so distinctly seen and felt in the hypertrophy as in the physiologically turgescent gland; this results, because in the tumors the interstitial substance is never so perfect a connective tissue as in the healthy mamma. Adenoid tumors are of very light reddish-yellow color; on a section, a pappy mucous fluid can usually be scraped from the cut surface; the latter would not be distinguishable, in many cases, from that of a carcinoma but for containing always small fissures, (the lactiferous ducts of middle size,) which in a careful examination with the naked eye are never looked for in vain; besides, the tumor is usually distinctly limited, surrounded by a special capsule, and thereby even to be distinguished from carcinoma.

These are the anatomical characters; as they vary, so also vary their clinical relations: if the tumor is very hard and brittle on a section through it, if hardly any serum can be expressed from the cut surface, we recognize therefrom the prevalence of a fibrous interstitial tissue, and the tumor belongs rather to the fibroids. If the cut surface is covered with a viscid, hyaline mucus, and has rather a light red color, then the interstitial substance between the acini consists of mucous tissue, and this somewhat modifies the prognosis (*vid.* the colloid tumors). The adenoid tumors may also incline towards, and finally pass into, carcinoma and medullary tumor, whereof more below. But invariably are found in them those little fissures which never occur in primary carcinoma of the gland, but in adenoid tumors may gradually expand into larger cysts; finally, the acini also may dilate into mucous cysts; and thus ensues the transformation into cystoid tumors and cystosarcoma.

The adenoids of the breast occur almost in every age from the 12th to the 60th year, in married as well as single women, with or without children. Their diagnosis is occasionally very difficult, especially in the beginning; as long as they are only swellings of the size of a bean or nut, they cannot be distinguished from engorgements of single acini as they often occur in women, (not considering even the period of lactation,) and in younger or older girls—movable painless nodes, of which one can at first give no definite opinion; the progress, only, and the success of resorbent remedies will make it clear, whether we have to deal with a chronic inflammatory engorgement or with a tumor. If the node grows, becomes uneven, lobulated, but remains painless, retains its firm elastic consistence and is movable in the gland itself and under the skin; the diagnosis of adenoid tumor can be made with much probability, especially if its growth is very slow and the tumor occurs in a young person. In older persons such a tumor not unfrequently undergoes a gradual change: it becomes painful, grows more rapidly, becomes very hard in the periphery, soft on the apex and altogether more and more immovable, until finally we can no longer doubt that we have now to deal with a carcinoma, especially if the axillary glands also begin to swell. Such metamorphoses of adenoid tumors into carcinomata do occur and can be anatomically demonstrated. In general, the course of adenoid tumors is favorable, the more so, the younger the individual, and the more fibrous the tissue of the tumor is at the same time; the nearer the interstitial tissue approaches to the colloid, soft or medullary sarcoma, the older the individual, so much the worse is the prognosis; in the first place, local relapses will occur, which then present themselves as pure carcinomata. Formerly, I would not have believed it, that in such cases an adenoid tumor really had been extirpated, had I not convinced myself of it by my own investigations; the returned tumor is extirpated, but very soon returns again locally, then in internal organs and in bones—in many cases, passing by the axillary glands, in others, after these also had degenerated into carcinoma. These secondary tumors almost always have a medullary character. In regard to the causes of such carcinomatous degeneration of adenoid tumors, especially in aged women, nothing definite can be asserted; I believe from some cases I may conclude that grief, cares and pov-

erty can conduce to it, as A. Cooper also teaches. The prognosis of adenoid tumors must therefore always be made with caution, even although in the purest forms the fatal issue is among the rarest, and, as has been remarked, is never to be feared in young persons, unless it be that the tumor had a true medullary character from the very beginning.

Many sarcomata of the salivary glands may also sometimes present a gland-like appearance, but yet this comparison is very far-fetched; we will speak of these tumors in connection with the soft sarcomata.

2. *The Colloid Tumor, Myxoma, Collonema, Colloid Cancer, Alveolar Cancer.*—Tumors of the consistence and color of boiled glue pertain to the most various tissues and are capable of very numerous combinations. Athough they do not, histologically, belong together, (sometimes one is puzzled as to whether they are cartilage, connective tissue, or a secretion,) yet in a clinical regard they form one group, inasmuch as all have a great tendency to return locally, and some of them, also, not seldom spread over the entire organism. In the first place, two forms of these colloid tumors can be distinguished by the naked eye, which by the microscope may be further divided into several sub-species.

(*a*) *Homogeneous colloid sarcomata:* they are rare in their pure form and always present on a cut surface a number of fine red dots, small extravasations, but otherwise no further structure. They occur more especially on fasciæ, combined with fibroid masses, with soft or even medullary sarcomatous substance; further, in the mammary gland, combined with adenoid and cystic formations; also, in the salivary glands, and finally, in the upper maxilla, in combination with fibroid tumor and fibro-sarcoma. Local relapses are not unfrequent, with more or less dangerous character according to the nature of the combination.

(*b*) *Areolar colloid tumors:* in these, we see with the naked eye a multitude of white capsules, in which the jelly is inclosed; when this is very fluid, the tumor assumes the character of the cystoid tumor or cysto-sarcoma, as in those growths frequently occurring in the ovary and the thyroid body (as *struma lymphatica* with accidental tuberculisation, calcification, extravasation, etc.)

Colloid enchondromata have almost the same appearance; they can sometimes be diagnosticated as such only by the aid of the microscope; in other cases, there is present besides the jelly a cartilaginous mass, distinctly recognizable with the naked eye. The soft cartilage in this case has by no means always resulted from one that had been firm, by softening, but has been primarily formed as such, the intercellular substance not having acquired the normal hardness. The favorite seat of these tumors is the scapula, the thigh, and the bones of the pelvis; they often cause very obstinate local relapses and sometimes lead to a general development of enchondroma in internal organs.

The colloid carcinomata have smaller, mostly microscopic alveoli, and occur principally in the liver and rectum; they are extremely rare, but finally spread in great number, *e. g.*, as small tubercles over the entire peritoneum. They do not, as far as my experience goes, essentially differ from the colloid enchondromata, except that well formed cartilaginous masses do not occur about them.

3. *Cystoid Tumors and Cystosarcoma.*—By *cystoid tumor* is understood a convolution of cysts, without other neoplastic mass than the walls of the cysts and their contents. In this purest form they occur seldom, and then contain either pure serum or mucus, that may be colored by blood from a light yellowish-red to a deep brown; their occurrence is confined almost alone to the ovaries, the testicles, and the cervical and sacral regions; in the latter case, usually congenital, as so-called *cystic hygroma.* Cystoid tumors do not return, if they can be extirpated completely; only consequent upon a pure cystoid in the testicle have I observed medullary tumors to form in the abdomen.

Cystosarcomata are called those tumors which consist partly of firm tissue, partly of cysts. Nearly all species of cysts can occur combined with nearly all species of tissues; the nature of the latter determines the prognosis. The luxuriance of the tissue can advance even into the cysts themselves in form of clubshaped, polypous vegetations, or papillary excrescences, especially in the mamma: *Cystosarcoma phyllodes*, *proliferum Muelleri.* Among the innumerable possibilities of combination, the following are the most frequent: In the mamma—adenoid tumor and colloid tumor combined with cysts; in the testicle—cysts with

cartilaginous formations and medullary cancer (occasionally with development of bone, pearly tumors, pigment, muscular fibres, etc.); in bones, especially the upper and lower jaw—firm yellowish-red sarcomatous substance combined with mucous cysts, or osseous cystoids with a little sarcomatous mass on the walls of the cysts, which contain mucus; congenital in the sacral region: sarcoma with cartilage and extensive development of blood-vessels, etc.

4. *Firm Sarcomata.*—The name sarcoma is a most unfortunate choice of the ancients; it is intended to denote "flesh-tumor," but what is to be understood by "flesh" is not clear; later authors would have it signify muscular substance, but then the sarcoma would be eminently rare, and not occur at all in the pure form; it could be diagnosticated only by the microscope. Histologically, we mean at present by sarcomatous tissue one which represents different degrees of development of connective tissue: granulation-like tissue, Virchow's mucous tissue with more or less intercellular substance up to fibrous tissue, tissue consisting of spindle-shaped cells, without intercellular substance (*tissu fibroplastique*, Lebert), or with colloid or fibrous intercellular mass. All these tissues carry the name of sarcoma so long as they grow at random without definite areolar arrangement, only pursuing certain directions of fibres, and sometimes even without these. According to the external appearance I would separate—the *firm*, the *soft*, and the *medullary sarcomata*, of which last will be spoken in connection with the medullary tumors. Generally characteristic of sarcoma is a globular, tuberous form, accurate limitation against the neighboring tissues and almost exclusively central growth of the tumors with the direction towards the cutaneous surface, without transforming the adjacent organs into morbid tissue, but only forcing them aside,—and the tendency to coalesce with the skin and ulcerate superficially. The consistence, the color, and the character of a cut surface is very variable; the latter is usually homogeneous throughout, without allowing any structure whatever to be recognized with the naked eye.

By *firm sarcomata*, I mean such as have a firm, elastic consistence, dirty light yellowish-red section, that usually becomes darker by exposure to the air, and from which a little opaque serum can be expressed.

These sarcomata occur, in the first place, in *subcutaneous cellular tissue* and in the *cutis*, are here remarkable for their extremely slow growth, and have a lardaceous, wax-colored section; they arise frequently from the fasciæ on the abdominal walls, thigh, (especially in women,) shoulder, and back. The slower they have grown, and the more amorphous their structure, the less noxious are they; their combination with distinct fibroid substance or with medullary mass excites the suspicion of their capacity for local and general relapses. They are, like fibroid tumors, poorly supplied with capillaries, but likewise contain small arteries, from which, when corroded, enormously violent hemorrhages can take place, as in the case of the fibroids.

The *central osteosarcomata*, moreover, belong to this class (*myeloid tumor*, Paget). Their favorite seat is the lower jaw, especially in children; here they occur purest and sometimes combine with development of mucous cysts and of osseous trabeculæ in the sarcomatous mass; the latter is situated in the centre of the medullary cavity of the bone; the cortical layer seems puffed up like a bladder, and rises above the healthy bone pretty abruptly. These tumors of the lower jaw but seldom return if they were thoroughly extirpated. In other bones, *e. g.*, ulna, radius, tibia, though with greater development of new-formed substance, the relations of the latter to the bone remain the same,—yet the tumor itself sometimes changes so considerably by tuberculisation, extravasation of blood-formation of cysts, calcifying and ossifying, and extensive development of blood-vessels, that it is difficult to recognize the original substance of the tumor. These latter sarcomata occur almost exclusively in adults of middle age, and usually necessitate the amputation; metastatic tumors consequent to them are rare.

Tumors, very similar to these central osteosarcomata, are also found on the gums, in old and young persons; here they go by the name of epulis, distinguish themselves by their bluish color, (the result of an abundance of blood-vessels,) and not unfrequently contain osseous nuclei; they are with difficulty removed completely, and hence apt to cause local relapses; in more aged persons they may sometimes also pass into cancroid tumors.

The *sarcoma of lymphatic glands*, the scrofulous sarcoma (Langenbeck), also belongs in most cases to the firm sarcomata.

It begins as a hypertrophic swelling of several groups of lymphatic glands, at first or altogether confined to one region only, especially on the neck or in the axilla. It always affects young individuals, partly scrofulous, but partly also persons apparently quite healthy. While at first, the several knotty, kidney-shaped lymphatic glands are plainly distinguishable, they gradually unite into a firm tuberous convolution, and in spite of all anti-scrofulous and resorbent remedies the neoplastic process advances incessantly. If it is confined to one part, *e. g.*, to one side of the neck, the tumors become so much the larger; if such formations are found at many points, *e. g.*, on both sides of the neck, in both axillæ, both inguinal regions, in the abdomen, etc., the individual tumors do not grow so large. They sometimes exceed the size of a man's head. They are perfectly indolent and usually do not soften. If confined to one part, the tumor may finally cease to grow and can be extirpated with success; but I know of very few cases where such a cessation occurred in the general process that evidently lies at the bottom of this. Most end fatally; the gland-like tubers spring up like mushrooms in all possible parts of the body, at last, too, in internal organs; (liver, spleen—Virchow;) finally, marasmus sets in and the patients die. On a section, the tumors look yellow, like glue, and take a darker hue in the air; from the homogeneous cut surface an opaque serum can be expressed. Only in small children have I seen a metamorphosis and softening of these tumors into perfect medullary mass. Continued use of iodine favors the softening of these tumors and accelerates death, and yet we hardly know what other remedies to apply. The prognosis of these tumors is evident from the described course.

5. By *soft* ("*breiige*"—pultaceous) *sarcomata*, I mean such as consist of a greyish-red, grit-like, granular, soft pulp, surrounded with firm, tough connective-tissue capsules; the surface of the unopened tumor is tuberous; close to one tumor arises another, and so on; the whole conglomeration, however, can be accurately enucleated from the neighboring tissues, which it pushes aside and causes to be resorbed; although all this can usually be seen only in the extirpated specimen, because the softness and brittleness of the tumor when once cut into in operating renders it often

very difficult to perceive its limits during the course of the operation.

As a prototype of this not very frequent form of tumor most of the pseudoplasms of the salivary glands may serve, which commonly, when not combined with cartilaginous or fibrous substance, present themselves as soft sarcomata, in which the pulp may be so soft as to communicate to the previously examining finger the distinct sensation of fluctuation, and the tumor, after being opened, might well be mistaken for an atheroma, from which it differs, however, by the often very complicated organization of its tissue. With these tumors the sack must always be extirpated, for otherwise relapses will be sure to follow. When the tumors develop in aged persons, there is no security against repeated local relapses even after radical extirpation.

On fasciæ and the sheaths of tendons, also, these soft sarcomata occcur, but generally combined with medullary tissue; I have seen such tumors, though with partly medullary character, in the bend of the elbow and on the hand; in the former case, the disease having until now returned locally four times, each time after a thorough radical extirpation. The more these tumors assume the medullary character and the sooner they ulcerate, the more pernicious are they; their progress is very much slower than that of medullary tumors, although they perhaps always become medullary in the end, and destroy life by metastasis to internal organs.

6. *Soft Papillary Tumors*, *Villous Tumors*, *Villous Cancers*, *Condylomata.*—They are the same on mucous surfaces, as the horny excrescences on the cutis. The acuminate and the broad condylomata* are papillary prolifications of the mucous membrane, which, as is well known, develope more especially at those points, where the external skin passes into mucous membrane; † they pertain exclusively to the syphilitic process. Be-

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* German authors apply the name *condylomata lata* to the syphilitic "*plaques muqueuses*," and designate as *c. acuminata* the (non-syphilitic) "*condylomes*" of the French. (Cf. Virchow's Cellular Pathology, tr. by Chance. London, 1860; note on page 245.) The author's assertion at the end of the above sentence probably has reference only to the broad condylomata.—Tr.

† Broad condylomata have recently been found in the larynx also. (V. Deutsche Klinik, 1860, No. 48; and Virchow's Archiv. xx. 402.)—Tr.

sides, villous excrescences occur on the mucous membrane of the nose, of the urinary bladder, on the gums (very rarely), and on the mucous coat of the stomach. In all these latter cases, however, the villi do not constitute the only morbid product, but they are lodged either upon the substance of a tumor, or upon a tissue which underwent a morbid degeneration. This tumor-substance almost invariably bears a cancroid or even medullary character, and thereafter must be determined our prognosis; usually these villous cancers, which operate destructively alike upon the surface and in the depth, not only possess in a considerable degree the power of returning locally—especially as their extirpation can hardly ever be made radical—but the nearest lymphatic glands also are not unfrequently affected; yet they are but seldom followed, as far as my experience goes, by internal metastases, the cause of which partly lies in the dangerousness of the localities where these tumors develope.

III. TUMORS WHICH ALWAYS RETURN LOCALLY, THEN APPEAR IN THE NEAREST LYMPHATIC GLANDS, AND FINALLY IN INTERNAL ORGANS.

This group of tumors contains that which has ever been called Carcinoma and Scirrhus. In modern times the Cancroids, or epithelial cancers, have been separated from the carcinomata; they possess, in fact, many characteristic traits even in clinical respect, so that we have to consider the following three forms of tumor:

1. *Carcinoma* (*carcinoma simplex*—Foerster).—It is found especially in the mamma, and occurs ordinarily in women between thirty and sixty years of age, seldom sooner, but not so seldom later. A hard node—painful often from the beginning, in other cases not till later—develops in the mamma, at first slowly, then more and more rapidly. The swelling soon becomes immovable, coalesces with the pectoral muscle and with the skin, and gradually extends more and more, new nodes being continually added to its periphery. Fleshy and lean, married and unmarried, feeble and healthy, poor and rich women, with or without children, all are in like manner exposed to this disease. When the tumor has invaded the vicinity of the nipple, this is drawn inward; sometimes it secretes a serous or sanguinulent fluid. Soon after this, swellings appear in the axilla, which rapidly enlarge and are always

larger than according to the examination they seem to be; seldom the cervical glands are affected. Usually only one breast is diseased. In other cases, the entire mamma begins to swell, gradually becomes hard as stone, the skin thick, œdematous. Blue veins, however, may traverse the skin in *all* anywise large and firmly coalesced tumors of the breast; they are no sure sign of carcimona. In still other cases, a movable, painless tumor has long existed, but afterwards begins to pain, to grow more rapidly and to become immovable; the glands in the axilla now swell, and the tumor formerly diagnosticated as adenoid tumor, turns out to be carcinoma. I have never seen, that women under the influence of this neoplastic development had been materially affected in respect to their general health, up to the described stage of the process; they suffer nothing but the lancinating pains, occurring particularly at night, but which are usually tolerable, and the tumor, although often very extensive in breadth, seldom obtains in this (not yet softening) stage the size of a child's head. Hence all things indicate, that hitherto we had before us a local affection; thus it is regarded in modern times by most authors. This mode of view is very important in reference to therapeutic, and especially operative action, as we shall see below.

In the operation of these tumors, more even than in the previous examination, we perceive that the tumor cannot be enucleated from the tissue of the mamma and extirpated alone, but that a part of the healthy structures must be removed with it, in order to take away with certainty all that is morbid. The examination of the specimen further shows that the diseased tissue is pretty accurately marked against the normal, but both are so intimately united one with the other on their borders, that even in the removed specimen they cannot be separated. The form of the tumor is very uneven, especially on the periphery: a multitude of processes, appendices, white ramifications enter the adjacent fat, and if the skin is not yet entirely coalesced with the carcinoma, a number of white cords often run towards it. This mode of connection of the tumor with the adjacent tissue is to me one of the chief criteria of carcinoma. Cutting into the tumor now, we find the surface of the cut of a light, pale-reddish color, granular; pressing it or drawing the scalpel across it, we see a soft milky pulp expressed from it. Sometimes the cut surface pre-

sents yellow anastomosing figures, looking cheesy like tubercular matter; they are masses of cells, undergoing tubercular or fatty degeneration, and have, according to my experience, no especial influence on the prognostic importance of the tumor; J. Mueller has advanced a separate species of carcinoma after them, the *carcinoma reticulare;* we mention this only in deference to the unsurpassed anatomist and physiologist.

If the carcinomata are not extirpated in this stage, one tuber now begins to become more prominent, the skin on its apex is traversed by fine, very narrow, bluish-red vascular anastomoses, becomes shining, very tense and finally ruptures with a fissure,— or a vesicle arises on it, with whose rupture the first excoriation manifests itself. The prominent knot, while pressing forward, has become very soft, almost fluctuating, and the pains in it are sometimes pretty severe. If the tumors are operated upon in this stage, the soft tubers are seen to consist of a white medullary mass, that evidently resulted from the carcinoma, (usually, as we know from the microscopical examination, by rapid molecular disintegration and fatty degeneration, and also by an abnormally rapid increase of the cells.)

The excoriation on the softened point, small at first, rapidly extends in surface; no sooner is the very thin cutis destroyed than the soft pseudoplastic masses burst forth and a fungous ulcer is formed, with an ichorous discharge. If the softening still remains localized for a time, the ulceration remains the same; the white, fungous, luxuriating substance sloughs off gangrenous, and a crater-shaped or at least excavated ulcer, with rampart-like elevated margins, results. If the softening spreads rapidly, the ulcer also becomes large and larger, while at the same time the tumor gains in circumference and depth. Although the fungous walls around these ulcers are pretty high, yet they seldom acquire such a size as in an ulcerating primary medullary tumor. In this stage the patients suffer less from pain in the tumor than from the dreadful ichor the ulcerating surface secretes; hemorrhages, that often occur without any cause whatsoever, sometimes after a slight friction or blow, consume the strength of the patient more and more rapidly. The increasing swellings of the axillary glands gradually coalesce with the mammary carcinoma, and the ulcerating surface extends upon them also. Violent neuralgic

pains in the respective arm, intense œdematous swelling of the same,—consequences of the compression of the nerves and veins,—increase the sufferings of the unfortunate patients, for whom there is now hardly any other remedy than morphine, and morphine again.

This highest degree of local development of the carcinoma is not brought about, however, in all patients. The consistent progress of the carcinoma in depth can lead to the destruction of the ribs, finally to a perforation into the cavity of the pleura, and the patients have the good fortune to die of pleuritis; but sometimes not even this is granted to them: while the carcinoma increases in depth, a lingering local adhesive pleuritis is already established and the carcinoma passes into the lung without endangering life. Finally, the strength fails, which for an astonishing length of time resisted the ichorous discharge of an enormous (*"tellergrossen"*—of the size of a plate—Tr.) ulcer, and the patients die of exhaustion. In still other cases, the local affection obtains only a very limited extension; soon emaciation comes on, pains in the hepatic region, icterus, slight pleuritic irritation, sometimes chills with irregular intermissions, sweats, pains in the joints, a continued fever,—in short, symptoms as in a slow pyæmia, an eminent emaciation in a short time, horrible disfigurement and distortion of the features; in otherwise robust individuals the termination is long delayed, to the horror of their friends, until finally the often implored death relieves the sufferers of their unspeakable distress. It is always melancholy for the physician to look upon patients with incurable chronic affections without being able to help otherwise than by a permanent alliance with the brother of Death, Sleep, artificially induced by narcotics; but yet the last end of phthisical patients has always been to me rather less terrible than that of carcinoma patients. Both diseases are extremely popular, and although one endeavors to conceal from the patients the nature of their affection, they usually do know it nevertheless. The good humor of phthisical patients is well known; a patient with carcinoma, but especially a woman with carcinoma of the breast, accurately observes her state, from the appearance of the first tubercle of the mamma forward, and she is much more conscious of the frightful knowledge that she is affected with an incurable evil, than a phthisical subject, and

this knowledge becomes more and more prominent, particularly towards the end of the disease. Suicide in a consumptive patient is something very rare; in those with carcinoma it occurs more frequently; it is not without danger to allow passionate, excitable men distinctly to perceive that they are incurable. I witnessed a case, where a patient with carcinoma of the lower jaw, not susceptible of an operation, shot himself when he was convinced that he could not be operated upon, although he was, as far as possible, put off with the encouragement to be patient and to hope.

Let us now turn to the *post-mortem* appearances, which present themselves in subjects the victims of carcinoma. Sometimes we find no tumors at all in internal organs, particularly when the local process had been very extensive and death resulted from the ulceration and the exhaustion of the vital powers. In other cases of mammary cancers, carcinomata are formed in the liver especially, and that too often to a large extent; also in the lungs and upon the pleura, where they not unfrequently have the character of cicatrix-like white streaks; sometimes, finally, in bones. All these secondary carcinomata present themselves as soft white tumors, as medullary fungi; the firm granular carcinoma, as we have just described it in the mamma, does not easily occur in internal organs, whether primarily or secondarily. Hence we see that tumors of medullary character can combine with carcinoma, partly arising out of the latter, partly accompanying it in other organs,—just as different forms of sarcoma may be followed by medullary tumors. Nevertheless the medullary tumor must be separated from the carcinoma, because there are tumors which from the beginning are purely medullary, and usually, too, take a somewhat different course from that of carcinomata; when the latter soften down to a medullary mass, they thereby acquire also the clinical properties of medullary tumors, *i. e.*, they attack internal organs with great certainty and rapidity. Concerning the duration of carcinomata of the breast, this is very variable, the average being from about two to two and a half years: I believe to have observed that the course is the more rapid, the younger the individuals are and the further the softening has progressed; but many cases cause the observer to doubt such general prognostic signs very much. I have seen the case of a

woman of twenty-four years, who died after the extirpation of a still hard carcinoma, as large as a hen's egg, of six months' standing, and where several tumors already existed in the liver; and other cases, where in older women with fungous, ulcerating carcinomata, the first development of which occurred five or six years previously, no secondary cancers were found at all in the *post-mortem* examination. But, on the whole, these are exceptions to the usual course.

As to carcinomata in other parts of the body, they are very rare in the subcutaneous cellular tissue; they occur in the upper maxilla with great capacity for local relapses and with tumors of the lymphatic glands on the neck, hardly ever attacking internal organs, but usually becoming fatal by ulceration, or by perforation of the base of the skull. The carcinomata of the testicle are seldom observed as such, but usually as already softened, medullary tumors; only when there is occasion to extirpate them when still very young, which occurs rarely because of the difficulty of diagnosis during the first beginning of an induration in the testicle, we sometimes find carcinomata, light yellowish-red and granular on a section, that distinguish themselves especially by a strong tendency to tubercular metamorphosis. In other cases, the tumor begins directly as a medullary fungus. Carcinomata occasionally occur in many other localities, but the above are the most frequent. In the mamma, they often combine with scirrhus, of which more shall be said under that head.

It seems to be doubtless, according to the observations now existing, that the predisposition for carcinomatous disease is hereditary, although in a less degree in comparison to the predisposition for tuberculosis and scrofulosis. The being hereditable, however, is no proof whatever that carcinosis is primarily a general disease; there are many local affections, *e. g.*, moles, harelip, which are also hereditary.

The question, whether carcinomata should be operated upon, and when it is still prudent to undertake the operation, has been answered very differently at different times. Starting with the opinion, that the first tumor is already the product of a general affection, which is presupposed to exist in the apparently healthy individual, one will be glad that the morbid matter has at last been

localized, and will not extirpate the growth to avoid metastases to internal organs. The only observation that could be adduced in favor of this view, is, that sometimes the metastatic tumors are so much the less extensive the larger the primary tumor is. But this by no means always happens. Formerly, it was especially urged in favor of this opinion, that the lymphatic glands swell more rapidly when the tumor was removed early; this opinion, I believe, is based on doubtful observations; for it is impossible to determine, whether small engorgements of the lymphatic glands did not already exist at the time of operating, inasmuch as, *e. g.*, in primary cancers of the mamma, the glands, which are situated underneath the pectoral muscle towards the *fossa Mohrenheimii*, cannot be felt in most cases, even if they have acquired double their normal volume; one will be convinced of this when beginning to extirpate the axillary glands,—there seems to be no end of the packs of glands, they are more numerous than after the examination could be expected. I am therefore of the opinion, that the swellings of the lymphatic glands, which seem to develope particularly rapidly after the extirpation of the primary tumor in the breast, already existed previously to a great extent. That in ulcerating or in occult carcinomata so-called symptomatic enlargements of the lymphatic glands do occur, I by no means doubt; observation often enough shows, that enormous ulcerating fungi exist somewhere on the body, while the lymphatic glands are not swelled in the least; ulceration of carcinomata and medullary fungi, by itself, does not create any sympathetic enlargement of the lymphatic glands; wherever the latter exists, it already has the import of small cancers, even though—histologically—nothing carcinomatous can as yet be demonstrated in them.

The belief in the primary existence of carcinomatous disease, and in the development of the carcinomatous tumor as the product of the former, has in latter days been placed in the background. Unbiassed observation makes us perceive in most patients with carcinoma, at first, nothing else whatever but the local disease. Persons of the most various constitutions, with the most various accidental chronic affections, may be attacked with carcinoma; tuberculous individuals, also, are not excluded, although less frequently affected by it; there is no symptom of a

general affection of the body, be it ever so slight, that were common to all carcinomatous patients in the commencement of the disease. It is often enough found mentioned, a carcinomatous patient wore the expression of a deep-seated affection, a sallow complexion, that he was emaciated, with withered skin and muscles; but all this is true only of the end of the disease; in the beginning, we usually have before us healthy, often surprisingly robust persons, who present nothing morbid except their tumor. Hence the conclusion is near at hand, that *first the tumor, and then the carcinomatous disease*, is developed. This view is confirmed by accurately following up the course of the evil; we see, as it were, how the local disease extends; the adjacent parts become affected, then the glands, and only after this a general affection of the body is brought about.

This last described view of the cancerous disease, which now probably is the most generally accepted, must in consequence lead to other therapeutic measures. The object is, as early as possible to destroy the focus, from which the infection of the lymphatic glands takes its origin, and if possible to remove these also in order to retard the infection of the body at large. I do not doubt but that the adjacent tissues and the neighboring glands are infected by the carcinoma by a sort of direct contagion, and that the infection of the fluids of the whole organism originates from the lymphatic glands, in which case, moreover, the contagious matter undergoes an often protracted stage of incubation; but sometimes the contagious matter seems to be held completely back in the glands as by a wall; on this subject we shall say more in connection with the cancroid. This course of the infection of the tissues and the organism is true, however, only in reference to carcinoma and cancroid, but seldom applicable to the medullary tumors and to the sarcomata, when these occur metastatic; this is one reason also for separating the medullary tumors from carcinoma, of which I shall likewise speak more fully below.

2. *The Cancroid (Tumor)—Carcinoma epitheliale—Cauliflower-growth.*—In general, all the more important points that we stated in regard to carcinoma, are also applicable to the cancroid tumor, except that in patients who perish by it, tumors very seldom form in internal organs, since the great expansion of the

local tumors and those of the lymphatic glands terminates life by its location and the destruction of parts necessary for life, as well as by exhaustion of the strength.

The seat of these tumors is more especially:

(*a*) On the head and neck; namely, in the lower lip, the mucous membrane of the mouth, on the gums, cheeks, the upper and lower jaw, in the neck deep between the muscles, in the tongue, larynx, œsophagus, on the ear, less frequently on the scalp and forehead. Those who are attacked by it are particularly aged persons, most frequently individuals (especially men) between forty and sixty years old; in some cases, also, I have witnessed in the 20th, 24th, and 28th year of age, already, enormous tumors of this kind on the tongue and lower-jaw. The tumor commences at first either as an indolent node in the tissue, or as an exfoliating excoriation, or as a warty excrescence; in the two latter cases soon associated with induration and rapid fungous ulceration. The bones, *e. g.*, the superior and inferior maxilla, can be totally infiltrated and destroyed by the cancroid, and no tumor of any considerable size be visible; but the teeth fall out, and considerable pain soon manifests itself. The upper jaw is usually primarily affected; the lower is oftener surrounded by the cancroid which takes origin from the gums and periosteum. Cancroids, which begun as nodes, often exist on the neck and the tongue a long time before they ulcerate, but on the lip the ulceration appears soon; the latter is generally very fungous. The exuberating mass here seems to possess a little more vitality than in the carcinoma. If the ulcerating surface be pressed laterally, a number of white plugs can usually be squeezed out, as out of comedones. Lastly, even the hardest swellings of this kind may soften, while growing larger and larger, and this softening can advance to such a degree that the tissue is reduced to a puriform, emulsive fluid, and the ulceration seems like the evacuation of an abscess. Hemorrhages from cancroids are less frequent than from carcinomata, yet the secretion is just as bad, and the ichorous discharge is usually tinged with blood. Pretty soon the submaxillary glands enlarge, and grow, as thick, knotty tumors, with astonishing rapidity, until they surround the neck from one side to the other and threaten to suffocate the patient. In this state the patients usually die of exhaustion, whether oper-

ated upon or not, and when the *post-mortem* examination is made, we find but very seldom tumors in internal organs; that the latter occur at all, we only know from three cases reported by Virchow. In twelve or fifteen cases of the kind, which I dissected, I have never found internal tumors. Nevertheless, the sufferings of these patients are not less fearful than of those with carcinoma. The certain, and often very rapid relapses after the necessary operations which sometimes hideously disfigure the face, and the enormous local development, usually accompanied by violent pains, are to the patient as well as to the attending physician more terrible almost than if there were hope soon to see the poor patients' sufferings ended by the formation of internal tumors; but when the individuals are otherwise robust, as is generally the case, the torture sometimes lasts dreadfully long. The whole tongue, the pharynx, upper and lower jaw, and the lymphatic glands, all will join in one mass of tumor; the patients can neither live nor die, and sometimes are condemned for months yet to lead a miserable life, half starving and half suffocated.

(*b*) Another region of the body, which is most frequently visited by the cancroid, is that of the genital organs and anus. The cancroid tumor of the penis occurs in the shape of condylomatous productions on the prepuce, or as an induration on the glans, and can attain enormous dimensions. On the scrotum it occurs especially in English chimney-sweepers, as so-called "chimney-sweeper's cancer," caused, it is said, by the soot of pit-coal. The cancroid ulcerations also spread upon the labia minora, clitoris, and from thence up into the vagina. More frequently than in all other localities, the cancroid is observed on the *portio vaginalis uteri*, where it luxuriates in the form of warty, fungous excrescences, and secretes a sanguinulent discharge of penetrating, offensive odor; it is known under the name of *cauliflower-growth*. The cancroid tumor of the rectum, generally known as *strictura carcinomatosa*, in most cases attacks the entire circumference of the rectum, and is seldom confined to one or the other side. Imperceptible at first, it finally causes the most violent pains, usually ulcerates and is covered with fungous granulations, and afterwards extends to the bladder, the prostatic gland and the sacrum. It has struck me, that patients with *carcinoma recti* were affected at an especially early date with

debility, emaciation and a sallow complexion. Seldom the anal orifice is affected, usually the cancroid begins from ½–1–2 inches higher up.

I believe that the experienced surgeon will agree with me, in asserting that the operation in the last named parts allows of a comparatively favorable prognosis, *i. e.*, that the local relapses of a cancroid of the penis and the labia pudendi, of a carcinoma recti, of a carcinoma epitheliale uteri, do not occur as rapidly as after the extirpation of the same tumors in other localities, provided that the extirpation could be made complete. The swelling of the lymphatic glands, too, developes more slowly. All these patients finally die of the sanious discharge and the hemorrhages, but here also we hardly ever find tumors in internal organs.

Finally, we have the cancroids in the integument of other indefinite parts of the body; I have seen them extirpated from the hand, foot, and leg, but cannot state any thing more definite as to their course. On a section, the cancroid tumors appear perfectly white and have a soft granular cut surface; they can sometimes be torn in certain directions, and, in drawing the scalpel over them, emit a milky, seldom an opaque mucous pulp. On the boundary of the healthy structures, the cancroid substance is not seldom seen advancing into the tissues in the form of white pegs (*Zapfen*). Very fresh cancroids, and newly returned tumors, appear purely lardaceous, dark-yellow, with little serum on the surface of a cut. The fungous ulcerations sometimes present on their section a medullary character.

3. *Scirrhus, Fibrous Cancer, Atrophying Cancer.*—While in the beginning of this century the appellations *scirrhus* and *scirrhous* were still applied to almost all hard, chronic indurations, the capacity of this designation has now been reduced to one form of tumors, which, as far as my observations extend, occurs only in the mamma and in the skin.

The scirrhus of the *mamma*, or the atrophying (*atrophirende*), cicatrizing cancer of the breast, is properly no tumor, but an induration, with simultaneous atrophy of the organ. It is, so to speak, the mildest form of carcinoma—if all the tumors belonging to this group may be designated as carcinoma, (*carcinoma simplex, epitheliale, cicatricans.*) The scirrhus develops

mostly in lean women between fifty and seventy years of age. The already very atrophic, but soft mamma indurates at one point, and this induration gradually coalesces with the skin, which is very much contracted in the form of a navel, and corrugated like a cicatrix. Usually the progress of this induration is accompanied by lancinating pains. Small, but very hard tubercles, of the size of a pea or bean, soon appear in the axilla, sometimes with contracting scars in the skin; these can extend into the depth, so that the arm becomes painful and œdematous. When in these indurations of the breast ulceration is brought about by epidermidal necrosis (*Verschorfungen*), the ulcer remains flat and secretes little serum. The scirrhus in its purest form admits of a very passable prognosis, the patients, operated or not operated upon, may live for ten or twenty years after the development of the first induration; and as this disease occurs only in aged women, most of them will die of other accidental diseases. Rarely the scirrhus remains in a pure form, but is complicated with carcinoma. While a part of the gland becomes scirrhous and atrophied, one lobule will give origin to a carcinomatous swelling, which then takes its usual course. Although in this case the infection of the body takes place far more slowly than in carcinoma, yet finally it runs its course, and a little later the patients do not escape their terrible end. After the extirpation of the entire scirrhous, atrophied breast, sometimes no relapses occur at all, or else carcinomatous swellings are developed in the cicatrix or in the axillary glands at a very late period.

In the examination of extirpated scirrhi of the mamma, one is sometimes astonished, to what a minimum the whole gland, once so active, can be reduced; in one case which I examined, it scarcely equalled the size of a dollar (*thaler*). In the examination from without (*in situ*—Tr.) one can form no very accurate opinion of the degree of the atrophy, because an enlargement of the *panniculus adiposus* replaces the want of glandular substance, and, in view of the age of the patient, the form still seems unchanged.

The examination of extirpated scirrhi always shows, on a section, a preponderance of cicatrix-like tissue of the firmest texture, grating under the knife (*cancer ligneux*—Velpeau); near the nipple the larger lactiferous ducts sometimes remain dis-

tinctly visible as prominently marked white cords, or perhaps filled with a cheesy, granular, yellow pulp. Near them we not unfrequently find a light brownish-yellow firm mass of a lardaceous gloss, that forms a knot on the margin, and from a cut surface of which a little serum only can be scraped off with difficulty. (*Cancer lardacé*—Velpeau.) From this yellow lardaceous infiltration the scirrhus always, I believe, takes its origin, although we do not in all cases discover it in larger masses; and it is probable also that from it a carcinomatous node may arise. It seems to me to be an ill-developed, yet never unsuspicious carcinomatous infiltration, the presence of which in larger quantities should always lead us to suspect an inclination towards carcinoma, and therefore, possibly, more rapid relapses. There is still another modification of the scirrhus of the mamma, which may occur when it affects the entire gland, or both, and especially the skin; then innumerable, gradually coalescing, flat swellings arise in the skin, and the latter assumes a brown-red color, shining as if indurated; without any very perceptible intumescence, sometimes with violent pains; the entire anterior and even the lateral surfaces of the thorax are surrounded as by an armor, (*cancer en cuirasse*—Velpeau,) so that the rigidity of the skin (which may affect also the intercostal and pectoral muscles so as to result in their complete atrophy) can even disturb the respiratory movements of the thorax. In these cases an operative act must not be thought of.

The scirrhus of the *skin* occurs likewise only in aged persons, and always appears as an ulcer. Usually it begins with a yellowish, exfoliating spot, sometimes with a low production of warts; soon after, a small shallow ulcer is formed, with infiltrated, extremely hard margins; this never extends much in depth, but expands in superficies. The base of the ulcer ordinarily is yellowish-red, smooth and shining, with a little serous secretion, sometimes a thin discharge forming scabs upon it. Pains are almost never present. Sometimes the ulcer cicatrizes spontaneously on one side of the margin or in the centre, while in other directions it extends; the increase of the *ulcus rodens* or *cancer cutaneus*, as this affection is customarily called, is slower than that of any other ulcer; in one case it had, in seven years, acquired no more than the diameter of one inch. Its principal seat

is on the nose, glabella, forehead, in the temples, on the eyelids, cheeks and ear. Very seldom the affection is transferred to the lymphatic glands; I have observed this only twice; there is so little occasion to make *post-mortem* examinations of such persons, that it is difficult to judge whether this form of scirrhus in the skin can become dangerous by infection of the body; I believe not. In one case, where death ensued upon the extirpation of such an ulcer, I found no tumors whatever in internal organs. I have long hesitated, whether it would not be better to designate it as *lupus senum;* but yet the extremely slow course and the cicatrizing character of the ulcer, together with observations of cases where this disease was combined with cancroid tumor and accordingly took a more rapid course, induce me to consider the *ulcus rodens* as a true *scirrhus cutis* and to parallel it with the *scirrhus mammæ.** After the extirpation, the pure, very dry *cancer cutaneus* but very seldom returns; but if the walls of the ulcer were very thick and show a section like that of cancer, while in the simple cases they have a lardaceous aspect, a more rapid course may be prognosticated.

If I may be allowed, at the end of this group, which unfortunately contains the most frequent tumors, to add a few general remarks on their operative treatment—I consider it as undoubtedly correct, according to the observations we possess at present, *to extirpate all carcinomata which can be radically extirpated without direct danger to the life of the patient. If lymphatic glands are already swelled, these must be extirpated with them; if this is impossible, then indications for the extirpation of the primitive tumor are only exceptions, such as violent hemorrhages, excessive pains, enormous discharge from the ulcer.* In such desperate cases, we may sometimes, by a — perhaps very bold—operation, obtain relatively favorable results. If the patients overcome the first shock of the operation, they sometimes begin once more to revive when freed

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* *Cf.* the report of J. Hutchinson on forty-two cases of rodent ulcer in the *Med. Times and Gazette;* H. regards it as "very nearly allied to cancer," but would reject the name of "cancer of the skin," and prefers to call it rodent ulcer. (Vid. Amer. Journ. Med. Sc., January, 1861, p. 272.)—Tr.

from the carcass they carried with them, which excluded them from all human society by the pestilential atmosphere that always surrounded them. Here, in Berlin, where carcinoma patients are often sent whom one must regard as victims of death in a few weeks, I have witnessed examples of such patients leaving the hospital in the belief that they were completely cured. The new invigoration, it is true, does not last long; yet it is always gratifying in such a disease to be able to help for a time at least. Unfortunately, in most cases, where considerable irremovable tumors of lymphatic glands already exist, the primary carcinomata themselves no longer admit of an operation. Then, a local remedy remains to us, namely, the *ferrum candens*, which in these very cases sometimes has wonderfully beneficial effects, and, for the weal of the unlucky patient, should never be neglected, but used to afford him at least some temporary relief by the destruction of the ulcerating pseudoplasm. *I regard it as a duty earnestly to advise every patient with a removable carcinoma or cancroid in favor of operation, and I regard it as harmless also to remove a scirrhus of the breast or skin at the request of the patient, if the latter is not too old, and otherwise of a strong constitution;* for, to very aged persons, a simple confinement to bed for some time is not without danger. I would not advise the operation of a scirrhus, and would extirpate it on the face only when it is possible to do so without a consequent extensive plastic operation. Such operations sometimes indeed succeed unexpectedly well, but an old withered skin does not bear any great locomotion; union by first intention frequently does not occur, the wounds heal slowly, and the patients suffer for an unproportionally long time after the operation. Here it depends altogether on the individuals and on the seat of the disease. Experience from a greater number of cases, only, will indicate the final decision as to what to do and what to leave undone in the individual case.

IV. TUMORS WHICH USUALLY SOON RETURN LOCALLY, AND RAPIDLY EXTEND UPON INTERNAL ORGANS.

1. *Medullary Tumors, Medullary Sarcomata, Medullary Carcinomata — Fungi Medullares* (Encephaloid — *Tr.*) — By

these names, we designate tumors of a very soft consistence and an encephaloid appearance on a section. The color may be changed by gangrene of the substance of the tumor or by extravasations of blood; but originally the tumors are of a pure white color, usually very deficient in blood. Seldom only an especially prominent production of vessels combines with their development, so that the tumors obtain a blood-red color, (*fungus hæmatodes*,) and then, of course, the similarity to the substance of the brain disappears.

I find that, aside from their anatomical distinction, these medullary tumors present so many differences from carcinomata, that I have therefore separated the two altogether. Various sarcomata, adenoids, carcinomata, can combine with, or be transformed into, medullary fungus, but there is also not an inconsiderable number of cases, in which the medullary tumor appeared primarily as such. I will endeavor to characterize these cases in the following:

The medullary tumor is developed only in young persons and children, from the first to, at most, the fortieth year of life, most frequently between the tenth and twenty-fifth. Generally, perfectly healthy persons are affected, but emaciation and the expression of a serious affection sometimes make their appearance after a short time already. The most frequent primary seat is the bones and periosteum: femur, tibia, especially the knee-joint, more rarely the region of the hip and the tibio-tarsal joint, the tarsal bones, the hand, forearm, scapula, upper maxilla, and cranial bones. Fasciæ and the sheaths of tendons, the subcutaneous cellular tissue, and the muscles, are likewise fit ground for medullary tumors to grow upon. In the testicles, also, and in the mamma, the medullary tumors occur; seldom in the rectum and the neck of the uterus. They grow very rapidly, the skin covering them soon becomes red, and fluctuation appears very distinctly, so that the mistaking it for an abscess is excusable. With the increase of the tumor the skin gradually becomes thinner and soon begins to ulcerate. Now the tumor grows more and more rapidly, the new-formed masses sprout forth in abundance, and are laid over the sound parts like mushrooms. The fungus assumes on the surface a blackish-green color and secretes little; but small shreds of gangrenous tissue are continually sloughed

off. If the tumor be examined after the extirpation or the amputation of the respective limb—(a resection can but very seldom supply the place of the latter, on account of the accompanying considerable destruction of the soft parts)—the diseased parts are generally found separated from the normal by a sort of capsular investment of the fungus, like a sarcoma, to which it presents more similarity in this respect than to carcinoma. Very rarely the respective lymphatic glands are swelled in cases of medullary tumors; in many instances they are not enlarged at all during the entire course of the disease, but they can also become the seat of a relapse, unless—which is more frequently the case—the tumor returns on the stump or in the cicatrix, often while the wound is still in the progress of healing. Cases occur, in which after the first or second operation the morbid process makes a pause of some months, and the patients regain their strength surprisingly; one is in hopes to have been mistaken in in the diagnosis; but afterwards these patients also soon perish by it. Usually, signs of the formation of tumors in internal organs occur already, while we are yet considering whether a second operation is practicable. The ulceration of the external relapses accelerates the decline of the strength, and the patients sink rapidly, until death relieves them of their sufferings. The mean duration of the whole course of the malady is from one to one and a half years. In case of medullary tumor of the testicles, the retroperitoneal lymphatic glands almost invariably become the centre of development of enormous secondary tumors. Tumors of this sort in bones not unfrequently omit to touch the lymphatic glands in their further progress, and nearly always cause metastases in the lungs. The primary medullary tumor in bone is not seldom traversed by osseous spiculæ, especially if it arises from the periosteum of the tibia or femur.

Inasmuch as the general infection of the body, with these tumors, can ensue without the lymphatic glands being affected, as has been observed, one might much sooner consider the dyscrasia as the primary affection in these than in the case of carcinoma; yet, when seeing patients with medullary fungi, and having occasion to notice that, in spite of largely developed tumors, they have a fresh, flourishing appearance, I believe one will incline as well towards the opinion, that the tumor itself is the focus, from

which the contagion gradually radiates over the body. Medullary tumors also occur congenital, *e. g.*, as *tumores coccygei.*

The powers of combination of the medullary fungi with other tumors are very manifold. In the testicle, ovary, and mamma particularly, the most various tissues, especially cysts, cartilage, bone, muscular fibres, etc., are developed in connection with medullary tumors. The most frequent combination is, as we have repeatedly stated, that of carcinoma or cancroid tumor with the encephaloid, the former assuming the character of the latter; the prognosis then holds a mean between the two forms, but there is so little room for a difference between the prognosis of the one and the other, that it can only be stated as a general proposition, that tumors combined with medullary masses allow us to expect a more rapid general infection, while in case of pure carcinoma or cancroid we must rather count upon the local development and tumors of lymphatic glands.

2. *The Melanotic Tumors, Carcinoma Melanodes, Malign Melanoses.*—The tumors are easily recognized by their dark bluish or brownish-black color. We exclude, for the present, the congenital, so-called liver-spots and the larger pigmented moles; and the yellow and orange pigmentations of soft sarcomata, caused by extravasated blood, are also omitted here; but we understand by melanotic tumor one which is remarkable for an intense dark pigment, developed at the same time with the new-formed tissue. Tumors of this sort are not frequent, and usually commence as a black spot, appearing like an ink-stain, or as a circular piece of skin painted with sepia. This spot gradually becomes elevated, a more or less prominent tumor, which, however, expands principally in surface, sometimes by the formation of new isolated spots around the first tumor. Soon the black growth begins to ulcerate, now extending more as a shallow ulcer, now as a fungous excrescence. The favorite seat of these black tumors is the skin and subcutaneous tissue, particularly on the feet and hands, but they also occur occasionally in many other places, on the skin of the chest and abdomen, in the axillary glands and the testicles, rarely in the mammary gland.

Another mode of development of melanoses is that from pigmented moles; a liver-colored or black mole gives rise to itching, is therefore scratched, begins to form a scab, enlarges and grad-

ually becomes an ulcerating tumor. This has been repeatedly observed by Langenbeck, and I have once seen this mode of development myself.

The extirpated tumors are soft, externally of a dark-bluish, internally of an intense bluish-black or brown color; the surface of a cut yields a fluid that could be used for painting, like sepia. Spread on paper in a thin layer, it has a light-brown color, and preserves for many years. In some cases, we find in the interior of the tumor partly a soft black mass, partly white medullary substance, sometimes also in part a substance of rather light brownish color. The black spots in the skin appear on a section as a simple line; they do not extend far in depth. The tumors are by their very color limited precisely against the normal tissue.

The course that melanotic tumors run, has the greatest similarity to that of the medullary fungus, only that it is sometimes still more rapid, and that, in general, the black tumors occur in older persons, at least beyond the 30th year of life. Primary pure and complete melanoses are followed secondarily by the same tumors; if the primary tumor was melanotic only in part, the secondary growths may be perfectly medullary, white. Peculiar to the melanotic tumor is an often extremely numerous distribution over the entire surface of the body; hundreds of black spots or bluish swellings may arise in the subcutaneous tissue in such an extent, as otherwise hardly ever occurs in carcinomatous or medullary tumors.

The question, whether intercourse with patients suffering from carcinoma, cancroid, scirrhus, medullary cancer or melanosis, can act contagiously upon healthy persons, must be negatived emphatically. Another, as yet little ventilated question is, whether the said tumors are inoculable. This has so little practical value, except perhaps in regard to *carcinoma uteri* and *carcinoma penis*, that it has seemed little called for to make experiments on this subject. I have twice inoculated the ears of rabbits with the fresh, warm juice of melanotic tumors, but up to three weeks after the operation nothing was visible. Locally, there was not the slightest reaction; and in the dissection of the animals, which I used for other investigations, nothing abnormal

was found. These experiments, however, even if they were made more extensively and always with negative results, could only prove that the cancer of man cannot be inoculated upon animals. Moreover, it must be taken into consideration, that even if the matter does take effect, a longer stage of incubation must be waited for. It would not be uninteresting to pursue these experiments on animals still further.

The classification of tumors herewith concluded, has, like every essay of this kind, its great imperfections, I well know; but as the above synopsis corresponds to observation and to practical wants, as I hope, it thereby accomplishes that purpose, which every classification of diseases can only have, namely, to facilitate the mutual understanding of colleagues. Many will reject the principle of classification; I am aware myself, that much can be said against it; but that for practical medicine, without detriment to science, the practical points of view, *i. e.*, those derived directly from clinical experience, the observations at the bedside, must always be placed in the foreground,—is a principle the physician should never lose sight of. I believe, that it will favor the popularity of the four groups advanced by me, to add to each group a general name. I have no new names to suggest, but only propose to apply the old names in the manner as they are used in the following synoptical table, with reference to the above detailed remarks:

1. Benign Tumors; i. e., *such as but seldom return after extirpation, but sometimes occur distributed in great numbers over the whole surface of the body.*

    1. The simple Cysts.

        (*a*) With serous fluid.
        (*b*) With mucous contents.
        (*c*) With pultaceous contents.
        (*d*) With blood.

    2. The Fatty Tumors.
    3. The Fibrous Tumors.

        (*a*) The soft fibrous tumors.
        (*b*) The hard fibrous tumors.

    4. The pure Cartilaginous Tumors.

5. The Exostoses.

   (*a*) The spongy exostoses.
   (*b*) The ivory exostoses.

6. The Vascular Tumors.

   (*a*) The telangiectases.
   (*b*) The cavernous hæmatomata.

7. The Horny Excrescences.

II. Sarcomata;—*Tumors which often return locally, but seldom invade the internal organs.*

1. The Gland-like Tumors.
2. The Colloid Tumors.

   (*a*) The homogeneous colloid sarcomata.
   (*b*) The areolar colloid tumors.

3. The Cystoids and Cystosarcomata.
4. The firm Sarcomata.
5. The soft Sarcomata.
6. The soft Papillary Tumors.

III. Carcinomatous Tumors; i. e., *such as always return locally, then appear in the nearest lymphatic glands, and finally in internal organs.*

1. The Carcinomata.
2. The Cancroids.
3. The Scirrhi.

IV. Medullary and Melanotic Tumors; i. e., *such as usually soon return locally, and rapidly extend upon internal organs.*

1. The Medullary Fungi.
2. The Melanotic Tumors.