

through the minute wounds beneath the epidermis into the corium remain there and undergo no further alterations, so that the design produced by them persists forever.

Tattooing is of interest to the physician really only in so far as repeated infections with syphilis have occurred in consequence of the habit of moistening the needle employed with saliva so as to make the pigment adhere.

The numerous attempts to utilize tattooing of the skin for the purpose of covering annoying pigmentations, in the case of *naevi*, etc., have unfortunately not been crowned with success, while, as is well known, tattooing of the cornea in opacities of that structure is often employed with advantage.

A similar effect is produced by the penetration of minute particles of carbon from powder burns, which in part are made intentionally with the same object as that of tattooing, in part are accidental, as in gunshot wounds, etc.

The color presented by these carbon particles through the skin is not a pure black, but has a distinct bluish tinge, probably due to the portions of skin overlying them.

In workmen, too, who have much to do with coal, miners and firemen, who are also largely exposed to injuries by falling pieces of coal, we often find small particles of carbon sprinkled into the skin which appear bluish-black, exactly like the granules from powder burns.

ANOMALIES

OF THE

SEBACEOUS GLANDS AND THEIR FUNCTION.

BY

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IMBEDDED in the several layers of the skin, we find a series of organs which represent invaginations of the epidermis into the corium. These blind tubes—sacciform or tubular formations—are the sweat-glands, the hair-follicles, and the sebaceous glands or follicles. While the sweat-glands represent deep-seated convolutions of tubes which, situated in the corium, penetrate it in gentle spirals, but traverse the epidermis in diminishing, cork-screw-like twists and always terminate by themselves, the hair and sebaceous follicles form virtually but one organ. The sebaceous glands belong to the class of acinous glands; in their simplest form, they occur as unilobular or bilobular, grape-like sacs, or else multilobular, mulberry-like (in the capillitium, on the nose, scrotum, etc.), and terminate in one efferent duct, together with a hair-follicle, or apparently alone. In the latter case, we find almost invariably small (atrophic) hair-sacs, with downy hair (*lanugo*), as lateral appendages, which either remain hid in the efferent duct of the sebaceous gland or project from the pore. Sebaceous glands and hair-follicles are organs appertaining together; they are either equally developed, in which case the efferent duct of the sebaceous gland terminates in the hair-follicle while still within the cutis, the sebaceous gland appearing as an appendage of the hair; or else, as on parts scantily supplied with hair, the hair formation is merely rudimentary, so that the small atrophic hair-follicle represents an appendage to the fully developed sebaceous gland and its efferent duct. The efferent duct of such a sebaceous gland is identical with the uppermost part or with the terminus of a hair-follicle. On perfectly hairless parts, we are forced to assume an absolute atrophy of the accompanying hair-follicle.

¹ When the esteemed author died, on January 7th, 1883, the manuscript for this chapter was found completed, with the exception of the sections on "*Acne rosacea*" and "*Sycosis*," the writing of which Dr. Th. Veiel was kind enough to undertake.

Both sebaceous glands and hair-follicles represent sacs surrounded by vascular networks; their interior is invested with epithelial cells arranged like those of the epidermis. The uppermost cells, forming the interior lining of the sac, are degenerating epithelial cells infiltrated with fat globules.

In the normal state, the cavity is filled with an oily, greasy mass, the cutaneous fat; the latter, under the microscope, is seen to consist of cast-off cells (either whole and filled with fat granules, or ruptured), of free fat globules, and crystals of cholesterin.

This greasy mass is frequently occupied, particularly at the ala nasi and the auricle, by a small, eight-legged, certainly quite harmless parasite, the *acarus folliculorum*. Chemical examination shows the principal constituents to be, approximately, five per cent of fat, together with water, an albuminoid substance, and in the ash chiefly earthy phosphates (Funke).

The *vis a tergo* and the contraction of the *arrectores pilorum* muscles, which are not subject to will-power, must be held to be the forces discharging the formed secretion. The more fluid the consistence of the sebum cutaneum, the less will the discharge of the secretion require the action of these forces.

As to the anomalies of secretion, we have to deal either with an increased formation (seborrhœa) or with a more or less diminished elaboration (oligosteatosi and asteatosi). In seborrhœa, the sebum is sometimes of normal consistence, sometimes it is unusually fluid or firm.

The disturbances of excretion, on the whole, are nothing but retention of the secretion (retention tumors, Virchow), occurring either in the gland proper or in its efferent duct, or in both, from narrowing or blocking of the opening. With the last named disturbances, of course, both the glands and the efferent channels are subject to manifold alterations; while in seborrhœa the glands and ducts, or at least the former, are not affected. If the efferent duct is merely mechanically occluded by the hardened secretion, there occurs the comedo with its sequels. Retention of secretion through contraction or obliteration of the efferent duct produces milium (*sive grutum*) or atheroma, according to the seat of the contraction, whether near the opening or deeper in the gland.

The contents of these three forms are at first nothing but the normal secretion of the glands and their efferent channels (sebum, epidermis, etc.); subsequently, however, they may be so altered by the admixture of inflammatory and degenerative products (serum, pus, blood, etc.), and by entire or partial absorption, that the "original character of the contents is altogether lost" (Virchow).

To these fundamental forms of disease it will be best to add the discussion of some dermatological morbid pictures which essentially represent a combination of the above morbid processes—viz., *acne simplex*, *acne rosacea*, and *acne mentagra* or *sycosis*.

The frequent participation of the hair-follicle and the hair in these forms of *acne* as well as in the elementary forms of disease of the sebaceous glands is self-evident.

A. ANOMALIES OF SECRETION.

1. HYPERSECRETION: SEBORRHŒA, SEATORRHŒA, ACNE SEBACEA, ETC.

An excessive quantity of the sebaceous secretion, liquid or solid, comes to the surface of the epidermis or between the hairs, the skin remaining unchanged, excepting the occasional occurrence of some dilatation of the opening of the sebaceous glands. The disease is most frequent in the young and may occur on all parts of the body excepting those not supplied with sebaceous glands.

According to the state of the secretion, whether more fluid, oily, or more firm and even dry, we speak of a seborrhœa oleosa or a seborrhœa sicca; but the scales or crusts, even if apparently quite dry, always contain fat. The drying of the exuded sebum cutaneum is probably due to a relatively larger amount of water contained therein, with subsequent evaporation. Both forms may exist side by side on the same individual, and also transitional forms between them; it is more appropriate, therefore, to divide seborrhœa according to its location. Accordingly we distinguish a general and a local seborrhœa.

a. Seborrhœa Universalis.

Every child is born with a quasi-physiological seborrhœa, with a covering of *vernix caseosa*, the sebaceous secretion accumulated during intra-uterine life; but after a few days the skin loses the tendency to increased elaboration of sebum. Quite different from this are the cases described under the name of seborrhœa universalis neonatorum, in which, after removal of the *vernix caseosa*, the whole body is covered with a deep red, glossy skin, looking as if it were varnished (Kaposi). Unless the bared skin is immediately covered with some grease, it becomes fissured, particularly around the mouth and anus. After some time the red skin is again invested with a sebaceous coating which, unless covered with moist or greasy rags, rapidly dries into hard fissured crusts. As a rule, the children succumb to their painful affection, after a short time, from *asthenia*. However, in these cases, described as seborrhœa universalis, it is certain that we are not dealing with a seborrhœa, but with an affection resembling *ichthyosis*, as is shown both by the diagnostic factor, that in seborrhœa the skin covered by it is normal, and by the unfavorable prognosis. Of general seborrhœa in the adult, to the best of my knowledge, there is on record only a single case described by Bielt. Finally it should be noted that whole races (*e. g.*, the negroes) are affected with a physiological seborrhœa universalis.

b. Seborrhœa Localis.

Seborrhœa of the hairy scalp.—In children it appears as a continuation and desiccation of the *vernix caseosa* which forms thin, firmly adherent crusts, colored more or less deep brown to black by atmospheric impurities. On removal of the firmly attached crusts, the underlying skin is found slightly macerated, covered with a thin, smeary coating of sebum having a rancid odor, similar to a part of the body which has for some length of time been covered with a rubber plaster or caoutchouc. If the disease be not interfered with, the crusts crumble to pieces in most cases after a longer or shorter time.

No other symptoms or sequels are to be noted, excepting, perhaps, at first a slow growth of hair.

In adults the disease appears in various forms, dependent on the nature of the secretion. In seborrhœa oleosa capillitii, the hair is continually greasy and smeary, forming a constant deposit of dust and impurities. Rapid desiccation of the oily secretion leads to agglutination of the hair into larger or smaller bunches.

Dry seborrhœa capillitii presents various appearances: where the formation of epidermis predominates, the scalp and hair are filled with glossy, white, flaky, sometimes flour-like scales, *pityriasis capitis*; if there be a greater admixture of sebum, a glossy white deposit is formed on the scalp; if the secretion be still more fatty—the most frequent condition—the scales, partly firmly attached to the capillitium, partly free between the hairs, are more yellowish, often stained by dirt, and have a greasy feel. As additional symptoms

might be mentioned, a lustreless and dusty appearance of the hair and often very considerable loss of it; where the crust is thick, an increased feeling of warmth; and where the skin is very irritable, sometimes slight itching. Often the scalp has a peculiar mouldy smell.

Where the secretion has become ragged and rancid, the seborrhœa capillitii may be complicated with dermatitis and eczema.

The duration is very variable, often lasting several years. Spontaneous recovery is not rare. The causes are unknown. Chlorotic and anæmic conditions, especially after grave and constitutional diseases, predispose thereto; it is probably for this reason that the female sex predominates among these patients, aside from the fact that wearing the hair long discloses very slight cases of seborrhœa which would be overlooked in men. Blond persons are most disposed to the dry, brunettes to the oily form of this affection.

Seborrhœa of the face, likewise, must be divided into seborrhœa faciei sicca and oleosa. The favorite localities are those possessing the greatest number of sebaceous glands. Here, too, the skin is normal, excepting that in a number of cases, especially on the nose and cheek, the openings of the efferent ducts are dilated. It is sometimes hyperæmic in the dry form and the patient has an itching, burning sensation.

Seborrhœa oleosa (preferring the nose, cheek, eyelids, and forehead) occurs almost exclusively in the young and dark-complexioned, and imparts to the affected localities an oily or fatty gloss; all attempts at cleanliness are in vain, barely an hour after the grease has been soaped off, the face shines as before. Where the excretion is slower or consolidates more rapidly, the skin is colored by atmospheric impurities, yellow, dark, to almost blackish.

Duhring describes a special form of seborrhœa oleosa nasi, in which the nose, the skin of which is reddened and exhibits dilated openings of the sebaceous glands, has an oily appearance and feels cold, a vaso-motor paralysis.

The dry form of facial seborrhœa, which is as frequent in older persons as in the young, and which often occurs as an immediate sequel of the variola eruption or after the recovery from grave cutaneous syphilides and other exhausting diseases, covers isolated parts, seldom the whole of the face, with a more or less thick and dirty mask of crusts, which always has a greasy feel even in the completely dry form. On detaching the crusts, they are seen to present on the side next to the skin a number of small, needle-like processes, spurs of dried secretion, corresponding to the dilated openings of the glands. The small processes, soft at their extremities, are formed like comedones and are composed chiefly of fatty enchyma cells and a few horny cells.

In ordinary cases the skin is barely reddened; but as the crust becomes drier and greasier, the redness increases and the epidermis becomes thinner and more vulnerable, bleeding easily; at the same time, however, the disease ceases to be seborrhœa and merges into the slighter forms of lupus erythematosus. These cases, in which at times one really does not know what diagnosis to make, have been named by Hebra "seborrhœa congestiva."

Dry seborrhœa of the face is often complicated with comedones and acne; such patients exhibit a tendency to the formation of comedones on other parts of the body.

Transition into eczema of the face, too, is not rare.

Seborrhœa corporis.—The sternal region, the interscapular region, the umbilicus, and the genitals are also favorite seats of seborrhœa. Seborrhœa of these parts exhibits no special peculiarity; that of the umbilicus and genitals has a pronounced tendency to provoke dermatitis, even eczemas, owing to the ready decomposition.

The *diagnosis*, except in the case of transition forms into other affections, such as eczema or lupus erythematosus, offers no difficulty. The underlying skin presents absolutely no anatomical alteration; it shows, at most, slight hyperæmia and quite superficial maceration of the uppermost corneous layers of the epidermis. Some forms of seborrhœa may be confounded, on superficial examination, with eczema; still, in such cases of eczema, vesication and dermatitic symptoms being absent, the course of the affection, the history (seborrhœa does not weep at any time), and the much greater permanent itching, which is hardly ever lacking in eczema, will facilitate the diagnosis.

Some forms of seborrhœa sicca may also be mistaken for psoriasis. But the thick, white, dry scales of the sharply circumscribed psoriatic patches, as compared with the relatively thin, very rarely pure white, always greasy-feeling, and indistinctly outlined spots of seborrhœa, will prevent error.

Seborrhœa of the sternal region often simulates herpes tonsurans, but the microscope soon clears up the doubt.

Really difficult and sometimes impossible is the diagnosis between some types of seborrhœa sicca s. S. congestiva and lupus erythematosus, particularly as both show a predilection for the nose and cheek. However, in most cases of lupus erythematosus there is present the membranous, dry, not fatty, shagreen-like, chalky, characteristic crust of epidermis, after the detachment of which a bleeding raw surface is left; while in seborrhœa sicca the crusts can be seen and felt to be thicker and more fatty; and when removed, they leave behind, as a rule, a scarcely reddened portion of skin, with merely dilated openings of the sebaceous glands.

The *prognosis* in seborrhœa is generally favorable, but often a long time elapses until complete recovery ensues; the restoration of the growth of hair gives rise not infrequently to considerable solicitude and calls for thorough treatment. I have seen some cases of seborrhœa oleosa which resisted all treatment.

Treatment.—The first is the causal indication: in chlorosis, preparations of iron, appropriate diet and regimen, etc. Chronic gastric affections require appropriate treatment. There are no specifics, although Duhring mentions, for some cases, arsenic in the form of the wine of arsenic.

While the general treatment combats the tendency to seborrhœa, often with success, the external applications remove mainly the present symptoms. The external treatment fulfils three indications: 1st, softening and removal of the secretion; 2d, alteration of the skin by the production of an artificial dermatitis; 3d, after-treatment, partly with astringents, partly with irritants, so as to prevent the recurrence of seborrhœa. Should it reappear nevertheless, the cycle is repeated at appropriate intervals; this is especially the case in pityriasis capillitii, with great loss of hair. The first object—softening and removal of the secretion—is best obtained by fluid or semi-solid fats or glycerin, as well as by mixtures of these; the addition of water is desirable, in proportion as the secretion abounds in epidermis. Any further admixture of drugs is unnecessary. Usually, oil or vaseline, or mixtures of equal parts of both, will suffice. In our clinic, we employ a mixture of olive-oil with the hydrated unguentum rosatum of the German pharmacopœia:

℞ Ung. rosat.,
Ol. olivar., āā part. æq.
M. ft. unguentum.

Duhring recommends mixtures of glycerin and water or alcohol (1:4). To the scalp the emollient mixture is applied by being rubbed in with the hand and brush. At night, the head is covered with a night-cap or hood. In the face, the detach-

ment of the crusts is attained most rapidly by a mask of strips of lint or flannel smeared with vaseline or the ointment; excellent results are obtained also by a mask of Unna's lead-plaster mull; either kind of mask is changed every twelve hours, kept in place by bandages of gauze, and applied only after the crusts have been moistened with oil or glycerin.

The crusts having been detached and softened (usually in one or two days), and the skin cleansed of fat and remaining crusts by means of warm water and soap, we enter on the second part of the treatment—the alteration. For this purpose we employ almost exclusively green soap in substance, applied three times daily to the parts affected with seborrhœa until a moderate dermatitis ensues. This usually consumes three days. Should the dermatitis become too violent, and acute eczema appear here and there, the soap infrictions are suspended, but the soap is not washed off until three days have elapsed since the first inunction. In the female sex the liquid soaps are preferable; the best of these are the fluid glycerin soap of the Vienna court pharmacy, or Hebra's alkaline spirit of soap:

℞ Saponis viridis,	200 parts.
Spiritus,	100 "
Misc. diger. filtra et filtrato adde	
Spiritus lavendulæ,	20 " and more (or
Spir. serpyll. thym., etc.)	
S. Alkaline spirit of soap.	

Where the hair-follicles participate largely in the seborrhœa (falling of the hair), the latter form is always to be preferred to either of the former. When the soap is washed off, the skin is reddened, the epidermis glossy and tense, slightly fissured, and desquamates as after scarlatina. While on the first day after washing off the soap it is not desirable to apply grease, mild ointments—ung. leniens or rosatum, with or without the addition of zinc, as well as Wilson's benzoated zinc ointment—may be employed from the second day on, according to the degree of the cutaneous irritation.

In place of the soap, metallic ointments—proto-iodide of mercury ointment, ung. Rochardi, etc.—may also be employed; but their use, to say the least, is unnecessary.

As soon as the skin is clear, the third indication has to be met: preventing the recurrence of the seborrhœa. This is done by the application of astringents and irritants, always best in alcoholic solution. Kaposi proposes carbolic, boracic, and salicylic acids; of the former, 0.15 gram; of the latter two, 3 grams in 100 grams of alcohol. We employ, with excellent results, a five-per-cent alcoholic solution of chloral hydrate, twice daily. Others extol petroleum, capsicum, cantharides, etc., with alcohol or in the form of an ointment. The addition of glycerin, but not above ten per cent, or the occasional application of oil or pomatum, prevents the skin or hair from becoming too dry.

Of astringents, tannin may be recommended in solution, or as a pomatum in seborrhœa capillitii.

℞ Acidi tannici,	10 grams.
Ung. pomat. sive rosati,	100 "

Piffard recommends tannin and chlride of iron in solution, the former also in powder. The pomades of extract of cinchona likewise belong under this head. Where there is great loss of hair, I frequently employ the following pomade.

℞ Extr. cinch. frig. par.,	1.5	grams.
Bals. peruvian,	1.0	"
Tinct. canth.,	1.5-2.5	"
Succ. citri,	1.0	"
Ung. pomatini,	50.0	"
S. To be rubbed into the scalp once or twice daily.		

In the above method of treatment, I have taken for granted that the patient can devote himself entirely to the treatment; but a different management will be required if the patient does not wish to neglect his business on account of it. The frictions with oil are made in the evening, the grease being removed from the face or hair in the morning, by rubbing with a dry cloth. In place of the soap, liquor potass. carbonat., pure or diluted with from one to four parts of water, according to the sensitiveness of the skin, is applied to the face morning and evening. The white floury appearance of the face after the employment of this remedy ceases with a slight inunction of vaseline. In very slight cases, daily softening and detachment of the crust, with subsequent washing, suffice. But in seborrhœa of the genitals it is advisable to dispense with fat, ointments, and frequent ablutions. Three daily ablutions with lead water, aqueous solution of carbolic acid (1:100), as well as the six-per-cent copper solution recommended by Kaposi (ærug., 0.15 gram; aq., 25 grams), followed by dusting with starch, have done me the best service. Quite recently, I have completely cured a similar case of seborrhœa complicated with frequent balanitis, by covering both glans and prepuce with Unna's zinc rubber-plaster muslin.

In the grave form of seborrhœa neonatorum, in ichthyosis sebacea, the child must be completely wrapped in greased rags and fed artificially, as it cannot nurse on account of the rhagades.

2. Diminished or arrested Secretion, Oligo-seatosis, Asteatosis.

Diminished or arrested secretion of sebum occurs only as a concomitant of certain groups of symptoms in which the perspiration likewise is diminished or arrested. This combination leads to extraordinary dryness of the skin with detachment of dry scales of epidermis (pityriasis), and fissuring at points of flexion and extension. This symptom manifests itself with physiological, senile, and with pathological atrophy of the cutis; also with excessive formation of epidermis, with ichthyosis. Both diseases are also described as xeroderma.

A slighter degree of defective secretion of sebum occurs in psoriasis, lichen ruber, and prurigo.

The lack of fat can be compensated for only by supplying fat to the skin, by applications of greasy substances the consistence of which resembles most closely the natural secretion (vaseline, cold cream, etc.).

Mention should perhaps be made of artificial asteatosis in domestics, laundresses, photographers, and others, although the secretion of sebum is not disturbed therein, but the excreted fat is at once dissolved again by alkalis, alcohol, ether, etc. Still, when this has continued some length of time, the secretion must suffer some alteration, because even if the former occupation be abandoned, several weeks of regular cultivation of the skin are often necessary to restore the normal activity of the sebaceous glands.

B. ANOMALIES OF EXCRETION.

RETENTIO SEBI.

The anomalies of excretion are, as above stated, merely retentions of the sebaceous secretion in various grades and stages of development: comedo, milium, and atheroma.

1. *Comedo.*

The term comedo is used for accumulations, in the efferent ducts, of hardened sebaceous secretion which was either produced in a too solid condition or dried up and hardened in consequence of defective discharge, appearing in the dilated openings as a dark (bluish) or even black point.

The comedo projects above the level of the skin; it varies in size from the point to the head of a pin. The favorite locations of this affection, besides the face, are the breast, the nucha, the back, and the genitals. If pressure be made from two sides, there appears a yellowish-white, vermiform structure the upper part of which is cornified (flesh-worm).

Comedones constitute a disease of youth, especially the time of puberty, but they are likewise frequently met with at a later age; the male sex is more commonly affected; blonds are more prone to it than brunettes.

There is hardly a single person in whom a comedo could not be found; it is merely the number and size of the black points which disfigure or annoy, especially if complicated with seborrhœa, which is not rarely the case.

Usually the comedo stands isolated, but occurs also in groups; in the latter case, each single one projecting slightly above the level of the skin, a verrucose conglomeration of comedones is formed.

The inspissated sebum generally forms a cylindrical plug filling the efferent duct which farther inward, corresponding to the sebaceous gland or hair-follicle, dilates into a bag or flask shape, and usually terminates in a soft point. This small body is inclosed in a membrane, a closely packed layer of flakes of epidermis which incloses several similar ones, but not so solid, in concentric arrangement. Between them lie the contents of the sebaceous glands, enchyma cells in good preservation and in the various stages of fatty degeneration, free globules of fat, plates of cholesterin, detritus, lanugo hairs, and not rarely one or more parasites (*Demodex* or *Acarus folliculorum*). The latter, barely visible to the naked eye, provided with six or eight legs, and approximately of the same shape as the comedo, occurs also in normal sebaceous glands without a comedo, and bears no causal relation to any affection of the sebaceous glands. The black head of the plug is produced by the retention of all sorts of atmospheric impurities.

Three factors may contribute to the formation of these plugs: 1. The secretion may be too firm; 2. it may dry on account of the excretion being too slight and tardy, and the *vis a tergo* lacking in consequence; 3. nervous influences may impair or arrest the second expulsive power, the activity of the *arrectores pilorum*. *Biesiadecki* and *Kaposi* assume that the lanugo hairs, emerging at about half a right angle to the axis of the efferent channel of the gland, continually irritate the opposite wall of the duct and thus produce an increased proliferation of cells, which would explain the structure of comedo.

Of the general causes leading to the formation of comedones we only know the above states of general debility producing weakness or paralysis of the nerves: chlorosis, anæmia, disturbances of important bodily functions, *e. g.*, of digestion, menstruation, glandular activity (scrofulosis). They are not due to excesses in *Baccho et Venere*, onanism,

etc. A local cause is occlusion of the opening of the efferent duct by dirt, uncleanness, and drugs (tar).

The termination of a comedo is either spontaneous recovery by expulsion of the plug when the discharging forces are restored, or inflammation and suppuration (acne).

Under this head belong also the ectasias of the efferent ducts of the sebaceous follicles described by *Küstner* as white comedones which occur in the shape of white points on the nose and around the mouth of the new-born; they are more numerous in proportion to the earliness of the foetal period. They are transition forms of milium, open milia.

Treatment.—Removal of the sebaceous plug, which is done without pain or injury by lateral pressure with two fingers; but the latter must be wrapped with linen, otherwise the epidermis is easily bruised off (*Hebra*). *Piffard* and others have devised special blunt instruments resembling a saddler's awl, comedo expressors; but every watch-key answers as well. The traumatic dermatitis arising from it is best combated with iced lead-water applications.

After the skin has again become normal, the sebaceous glands, etc., have to be stimulated into increased activity for some months; the best means for this purpose are, twice daily soaping, rinsing, and vigorous rubbing with a rough towel, or sea-baths. But all sorts of irritants are employed as a wash: *Liq. potas. carbonat.*, also solution of corrosive sublimate, at first stronger, later more dilute, and borax and sulphur ointments.

2. *Milium.*

Isolated whitish, rounded granules, often of a pearly lustre, usually the size of grits or millet-seeds, generally projecting hemispherically above the skin, covered only with epidermis. The favorite sites are those parts most amply provided with sebaceous glands, more especially where the skin is thinnest; in other words, where the efferent ducts are the shortest. While comedo is more a disease of youth, milium is most frequent in persons of middle age.

A milium is situated in the same layer of the cutis as the sebaceous gland; above the follicle there is either a thin portion of the cutis or else the epidermis merely is intact.

Milium shows no tendency to inflammation, but may remain unchanged for years, and causes no subjective symptoms.

Behind the occluded mouth of the efferent duct of the sebaceous gland, which may be closed either at the opening or through its entire extent, the secretion accumulates in the sebaceous or hair follicle, where it forms a round or lobulated body.

Similar to the comedo, it represents an organized body: around a point situated at the centre or external to it are formed a number of concentrically arranged, progressively enlarging membranes. The pearly lustre is probably due to this arrangement.

Sebum, partly or entirely degenerated epithelium, free fat, and small hairs, are situated between these lamellæ, consisting of firmly apposed epithelia. When the sebum is largely fluid, a yellowish translucent body is formed, *meliceris*. A microscopic section shows that the lamellæ, septum-like, divide the small tumor into segments.

Causes of the occlusion of the mouth of the sebaceous follicle are: 1. Those of comedo and atheroma, for this opening may be closed by any comedo, the irritation of the wall leading to inflammation around the efferent duct, and then, by cicatricial contraction, to obliteration of the mouth or of the efferent channel (*Virchow*). 2. A traumatic or other cicatricial formation. Recently I saw the formation of milia occur in an otherwise quite intact cutis and epidermis, within five or six weeks after a superficial abrasion of