

the papillæ being very much lengthened and branching tree-like. The epidermic covering is comparatively thin, and the horny layer especially may even be absent, but on the other hand the layer of prickle-cells is very much developed. The size of the papillæ is proportionate to the number of blood-vessels entering them.

Acuminated condylomata are a purely local malady, and the prognosis is accordingly good. However, when neglected, they may give rise to fever and disturbed general health from the absorption of pus.

*Therapy.*—The treatment may be rendered troublesome by the great number of the growths and their tendency to relapse. Small condylomata are best removed with frequent applications of Liq. ferri sesquichlor.; but the larger ones should be removed with instruments and subsequently cauterized. The galvano-caustic snare is most advantageously employed for the removal of the largest variety, because their removal with the knife may give rise to very profuse and even dangerous hemorrhage.

Broad condylomata are syphilitic papules which assume a different form from ordinary papules of the skin on account of special local conditions. They are flat roundish elevations of a reddish-gray or gray color, often occurring in great number, particularly on the genitals and vicinity. They are also found in other regions of the body where the skin lies in folds, and opposing surfaces are in contact, as between the fingers and toes, under the breast, within the folds of the chin, at the naval, etc. Very often two condylomata are situated in corresponding localities so that they touch one another when the folds of skin come in contact. By their coalescence they may form large "beds." Their surfaces are moist, often eroded or ulcerated, and covered with a foul puriform fluid. The character of this secretion varies greatly according to the situation of the growth, and the cleanliness and care bestowed upon them.

These flat condylomata are secondary syphilitic lesions, and occur coincidently with other lesions of secondary syphilis.

Sections through them show a marked hyperæmia and hypertrophy of the papillary body and an infiltration of the corium and epidermis with numerous lymphoid cells.

Besides the appropriate constitutional treatment, they require cleanliness, separation of the opposing surfaces of the folds of the skin, and the local applications mentioned in all text-books on syphilis.

In conclusion we may add that it would be expedient to drop the name of condyloma for these affections, for they are etiologically entirely distinct formations.

It is therefore better to separate acuminated condylomata as papillomata entirely from broad condylomata, which are always a symptom of syphilis and may be called papulæ madidantes.

## ANOMALIES OF THE EPIDERMIS.

### PART II.

BY

DR. A. WEYL,

OF BERLIN.

#### PSORIASIS.

PSORIASIS is a chronic, usually relapsing skin disease, in which profuse quantities of silver-gray scales, which can be removed readily by the finger-nail, form upon more or less large, reddened parts of the skin, which are elevated to a trifling extent. Parts of the skin covered by thick, white, or grayish-yellow layers of scales, and which may remain unchanged for years, with occasional desquamation of the superficial scales, are found especially at the elbows, knees, scalp, glans penis. Small patches, particularly at the elbows, may be long overlooked. In other cases, there is a sudden appearance, either with or without moderate febrile disturbance, in many parts of the body of bright-red, somewhat elevated, usually more or less itching efflorescences, varying in size from a pea to a twenty-pfennig piece, and which are soon covered with a thick layer of scales. If the scales are scraped with the finger-nail until the red shining rete appears, very slight further scratching suffices to make small drops of blood appear, *i. e.*, the papilla has been injured.

This acute form is called psoriasis punctata; after a short duration it increases into somewhat larger patches, known as psoriasis guttata or nummularis. As the patches increase, the central parts often lose their scales, and present a normal appearance, except a slight brownish discoloration, so that rings remain (psoriasis annularis or circinata), but rings may also develop from the union of circular patches. When this occurs, the psoriatic changes disappear at the points of contact, and curved lines in the form of wreaths, etc., remain. The term psoriasis diffusa or inveterata is used when larger patches are affected without distinct circular boundaries. In addition, there is a general psoriasis, and in some cases very few centimetres of intact skin are present.

The external appearances vary according to the situation and duration of the process. Upon the scalp are found either exquisite forms of nummular plaques covered with thick white scales, or large, moderately scaly circular forms extending beyond the boun-

daries of the hair towards the forehead; more rarely, pale-red, slightly scaly, small patches, especially in nervous, anæmic individuals. Smaller patches, with a moderate amount of scales, predominate in the face. The extensor aspects of the limbs are the sites of predilection of large, often diffuse plaques upon an infiltrated base, and covered with thick, white to grayish-white scales. Very obstinate patches of a deep wine-red to violet color are observed especially on the calves of individuals who have to stand a great deal and suffer from varicose veins. All forms are found upon the trunk; not infrequently the patches on the anterior surface of the chest, particularly in old people, are covered with yellowish-gray, branny scales which are fatty to the feel. The penis is usually the site of small spots covered with few scales. The dorsal surface of the hand and fingers is rarely affected, but exceptionally an affection is observed solely on the palm of the hand, associated with marked thickening of the skin and a tendency to fissuring.

The abundance of the scales varies to an extraordinary degree. Their color varies from dull white to grayish-yellow; they are usually smooth upon the surface, convex, and have a smaller diameter than upon their lower surface which is generally smooth and even, but occasionally presents small sharp spines (depressions into the hair-follicles). They consist of several layers, are dry, and readily break.

The color of the skin beneath varies from a delicate pale-red or yellowish-red to deep-red; the redness often surrounds the scaly spots, especially when the process is extending. The skin usually presents its normal consistence, and is moderately thickened only in old patches or those irritated by mechanical or chemical causes.

In some cases, the psoriatic process always remains very slight; in a few, patches persist for a long time, after a more or less violent eruption of psoriasis has reached its termination. In a third series, more or less extensive outbreaks follow one another at short intervals. The general condition often suffers considerably in such cases, in which the individual occasionally is covered with scales from head to foot. The general outbreak occurs with febrile disturbances; the patient must keep to bed, movements are annoying, even painful, because the reddened and tense skin readily fissures. A fatal termination has been observed exceptionally in this form which is very similar to acute pityriasis rubra.

Although, as a rule, the hair does not fall out even after psoriasis of the scalp of long standing, the occurrence of complete, incurable alopecia is not very unusual in some cases.

In inveterate, extensive psoriasis, the nails of the fingers and toes are usually implicated secondarily in the pathological process. They are very much thickened at the free edges, become laminated, have deep points like a thimble, or opaque, yellowish-white streaks; in places, irregular pieces break off, so that occasionally only small, deformed remnants adhere to the matrix. In some cases, the nails may, for a long time, constitute the exclusive site of the process.

It is more than doubtful whether true psoriasis occurs upon the mucous membranes. Bazin described as psoriasis buccalis ivory-white, occasionally bluish, shining, smooth, irregular opacities of the epithelium with normal interspaces.

If this callus-like process is more extensive, deep fissures, which often suppurate at a later period, readily occur in the underlying tissue during mastication. This affection has also been observed with syphilis, smoking, dyspeptic symptoms, after long-continued mechanical irritation from sharp carious teeth, in psoriasis<sup>1</sup> and lichen planus.

<sup>1</sup> Vierteljahrscr. f. Dermat., Schwimmer. In case VII., a leukoplakia preceded the psoriasis for some time.

Like warty formations on the skin, it is not infrequently the starting-point of carcinoma, particularly upon the lips and tongue. Cartaz<sup>1</sup> reports the transition of a psoriatic patch of a finger into carcinoma.

Laycock<sup>2</sup> obtained the following results with regard to the sensibility of the patches: 1st, tactile sensation is diminished; 2d, this diminution corresponds to the extent of the process; 3d, it is most marked upon the patches themselves; 4th, no accurate observations could be made concerning pain and temperature, but their diminution is usually insignificant.

Psoriasis usually begins in later childhood and youth, but not infrequently it occurs in the first years of life, or in mature years.

A peculiarity of psoriasis and some other dermatoses is its disappearance in severe febrile diseases, and its re-appearance after recovery.

*Etiology.*—The causes of the disease are shrouded in obscurity. Neither climate nor diet has the slightest influence upon its development, but it appears to be more frequent in certain races, perhaps on account of more frequent intermarriages. The entire series of constitutional diseases, which are supposed to be produced by micro-organisms, have been regarded as mediate or immediate predisposing factors; thus syphilis of the parents, tuberculosis (Wilson regards psoriasis as the analogue of pulmonary tuberculosis), malaria, etc. Wertheim maintains that he produced psoriatic efflorescences by the injection of penicillium glaucum and the fungus of beer into the vessels. Vivier<sup>3</sup> is thoroughly convinced of the parasitic nature of psoriasis.

The similarity of the clinical history of psoriasis to that of the dermatomycoses, particularly herpes tonsurans, led E. Lang<sup>4</sup> to the supposition that a fungus is the cause of the former disease; and later he succeeded in discovering the fungus. This is situated in Bulkley's so-called psoriasis skin (thin rete layer immediately above the papillæ). The fungi are readily visible after the addition of a five-per-cent solution of potash. They are round or oval bodies, with a very shining membrane having a double contour and colorless protoplasmic contents, almost as clear as water, but somewhat granular with the most powerful lenses. The diameter of these brood-cells (spores?) is 6–8  $\mu$  in width and often twice as much in length; in places they are constricted, or present outgrowths. Lang observed them grow, after the lapse of two or three hours, in potash 5.0 with glycerin and water  $\text{aa}$  50.0. The contents and membrane of the young cells are similar to those of the blood-cells; the free end is rounded or enlarged. Endogenous development of spores appears to occur in these enlarged ends. The hyphi are rarely segmented; occasionally, there are links arranged like a necklace of pearls; and, exceptionally, they present lateral sprouts. They are stained with great difficulty. Lang includes this fungus among the hyphomycetes, and calls it epidermidophyton. To cure psoriasis permanently, he requires that the patient remain under treatment until the affection is entirely removed. With slight modifications, his treatment is that ordinarily employed.

In my own investigations, I often found the brood-cells represented by Lang in Fig. 1 in the epidermis cells treated with a solution of soda, especially in the younger rete cells of eczema vesicles, pityriasis versicolor, etc. (I regard them as artefacts, as myelin-like (?) exudations). I have not detected the culture products in potash and glycerin.

<sup>1</sup> Gaz. des Hôp., 1878, p. 751.

<sup>2</sup> Med. Tim. and Gaz., March, 1871, p. 271.

<sup>3</sup> Ann. de Dermat., vol. i., p. 287.

<sup>4</sup> Vierteljahrscr. f. Dermat. u. Syph., 1878; and "Ueber Psoriasis," Volkmann'sche Sammlung, 208.

It has long been observed that in psoriatic individuals typical efflorescences develop with preference in places subjected for a long time to a mechanical or chemical irritant,

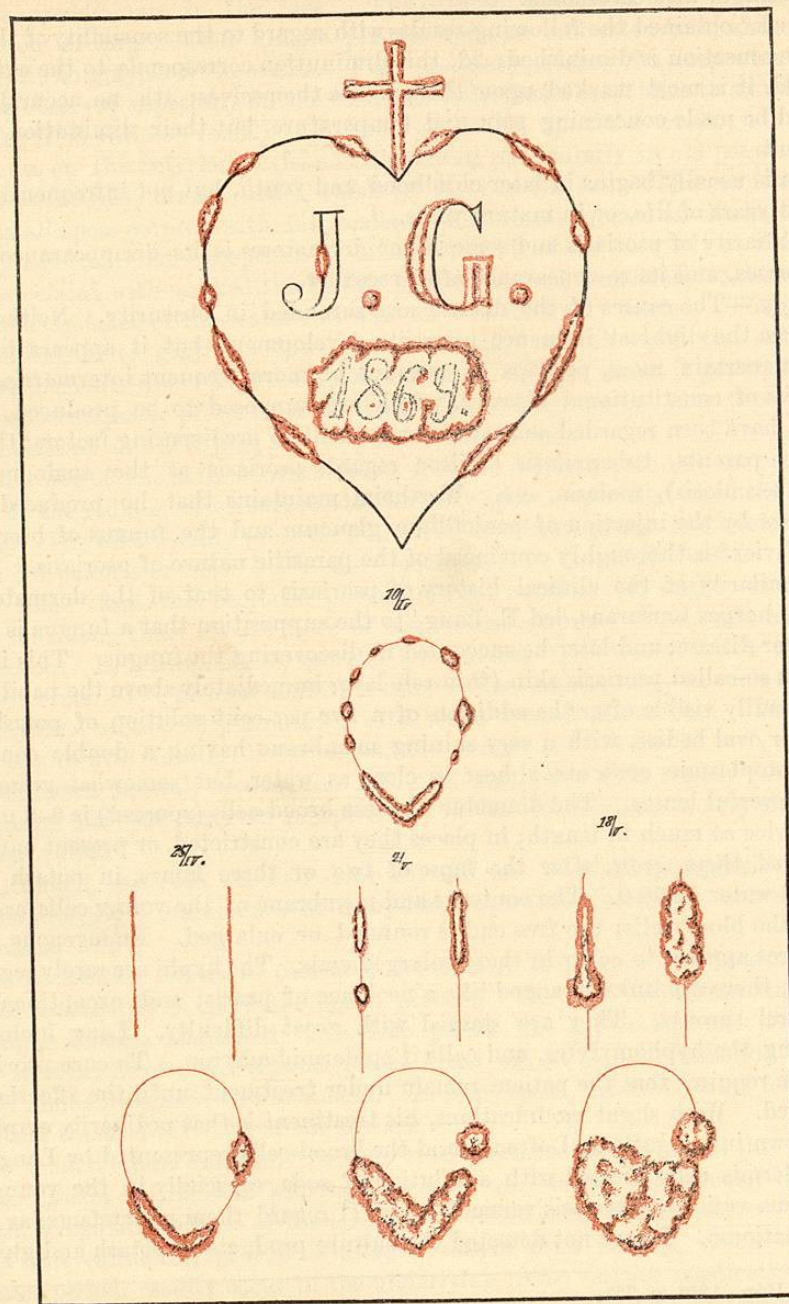


FIG. 20.—The uppermost figure represents the tattooing changed by the psoriasis eruption; the figures provided with dates show in succession the phases of the parts artificially irritated.

as after vesication, mustard poultices, cupping, at points of pressure from tight articles

of clothing, etc. This peculiarity has been utilized by Kœbner<sup>1</sup> in the experimental production of psoriasis by scratching with the point of a needle. At the time of a fresh outbreak of the disease or in extensive psoriasis, he has succeeded in producing typical plaques of the disease in any form desired upon artificially injured spots. According to Kœbner, this vulnerability of psoriatic individuals can be diminished or even extinguished by the therapeutic action of arsenic internally or tar externally.

Much more frequently, conditions of debility of a mental and physical character awaken the slumbering tendency to psoriatic efflorescences, for example pregnancy, lactation, exhausting labor, excesses in baccho, fright, etc.

Heredity plays a very prominent part in psoriasis, is perhaps its sole cause, and offers numerous opportunities for the observation of its various peculiarities (atavism, etc.). No rigid proof can be brought at present that psoriasis develops de novo or can be produced mechanically or chemically.

Bazin regards it as a constitutional diathesis, mainly hereditary, which is either of arthritic or herpetic origin, and gives, as he imagines, the characteristic differences of both forms. Others assume principally a single unknown internal cause, the dartrous diathesis.

It seems to me that only two explanations are possible: 1, to regard it as a chronic toxic disease like syphilis and leprosy; this is opposed by the fact that in these affections changes may develop in all organs; or, 2, as seems more probable, that it is due to a functional weakness of the nervous centre regulating the nutrition of the skin, dependent on hereditary taint; this view is favored by the constant, monotonous form of the efflorescence, and its tendency to symmetrical development. The anatomical process is merely the peripheral projection of the functional central disturbance.

It is a peculiar feature, which has not been considered sufficiently heretofore, that not all dermatoses may be combined, and that a number of them exclude one another. Thus, syphilis has no effect on an existing psoriasis, and in like manner all skin diseases produced by mechanical or chemical noxious influences (causes externes, parasites, medicinal ingesta, etc.), may be associated with it. According to Neumann, prurigo and ichthyosis have never been found associated with psoriasis.

*Anatomy.*—The most recent patches of psoriasis, before the appearance of scales is noticeable, show redness of the papilla; the view that psoriasis is not a primary affection of the rete is supported by the fact that it never occurs upon cicatrices in which the papillary body is not entirely intact. Only after the circumscribed redness with superficial scaling and the other characteristic appearances permit a diagnosis, can we follow the further pathological changes, as those parts of the skin of the psoriatic individual which appear intact, present no abnormality under the microscope.

In accordance with the earlier investigations of Wertheim, who found enlargement of the papillæ and markedly dilated coils of the papillary vessels, and those of J. Neumann, who, in addition to vascular dilatation in the cutis and papilla with perivascular round-cell proliferation, demonstrated considerable development of the rete and horny-cell layers, Hebra<sup>2</sup> found the rete layer developed more than normally, enlargement of the papillæ from œdematous infiltration and perivascular cell proliferation; the latter is very marked in old patches, which also present pigment granules in the deeper rete layers, and in the papillæ and corium.

A. R. Robinson<sup>3</sup> found that the enlargement of the papillæ was only apparent, due

<sup>1</sup> Jahresber. d. schles. Gesell. f. vaterl. Cultur, 1872, and Lecture in Berl. Med. Society, 1878.

<sup>2</sup> Lehrb., ii. Aufl., S. 335.

<sup>3</sup> Arch. of Dermatol., vol. vi., 1873, and Jamieson, Edinb. Med. Journ., 1879, p. 622.

to proliferation of the rete and especially the projection of the interpapillary prolongations of the rete into the cutis. A slight true enlargement of the papillary body is only produced by a very moderate swelling of the connective-tissue bundles, by the hyperæmia and extravascular production of lymphoid-cells.

His view that the primary anatomical process consists of proliferation of the rete, and not of hyperæmia of the papillary body, is based on the following reasons: 1, the enlargement of the interpapillary projections stands in no causal relation to the dilatation of the vessels in the papillæ; 2, small epithelial outgrowths occur even when no hyperæmia can be perceived on account of the deep situation, as in the external root-sheath of the hair which is the analogue of the rete; 3, the hyperplasia of the rete occurred even when he removed two adjacent pin's-head plaques with the intervening healthy skin; here the change in the rete extended beyond the apparent border of the two papules, so that

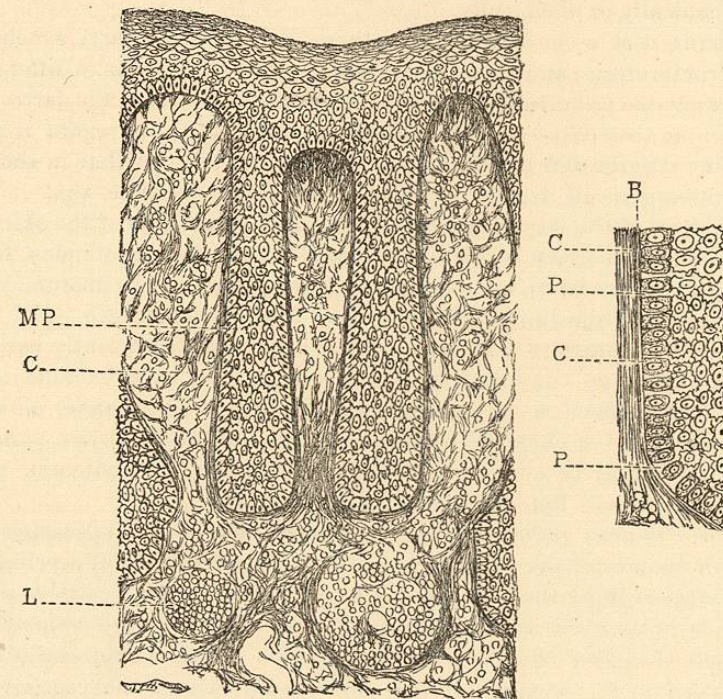


FIG. 21.—Section of a patch of psoriasis, after Jamieson. MP, the elongated interpapillary cones; C, infiltrated papillæ; L, dilated vessels filled with blood-globules.

they were closer together in the deeper than in the superficial parts. (Could R. measure the size of the papules so accurately during life, especially when the question is of such a subjective character, as to determine where a macroscopic change, *i. e.*, a slight redness of the skin, which as a rule passes gradually into the normal color, has reached its limits? Author.) Robinson found the vessels of the papillæ and upper parts of the corium dilated with profuse proliferation of round-cells around them, also lymphoid cells around the ducts of the sweat-glands and sebaceous glands. He attributes the elevation of the plaques to the hyperæmia and infiltration of the cutis rather than to the rete changes. In inveterate patches the rete prolongations often become very much elongated and thickened at the lower end, and there is round-cell proliferation around the dilated vessels. Exceptionally the smooth muscular fibres become hypertrophic.

In the recovery of psoriasis, the enlarged interpapillary prolongations shrink to their former shape, the vessels become narrower, and the cellular perivascular proliferation, like the serous exudation in the connective tissue, is absorbed; but the hyperæmia continues after the absorptive processes are completed, and abnormal discoloration usually remains at the site of the plaques.

Jamieson found cells often with three nuclei in the hyperplastic rete prolongations, and the presence of prickle-cells extending to the palisade-shaped cells immediately above the papilla; this he regards as the sign of active hyperplastic processes in the rete.

J. Neumann<sup>1</sup> found the palisade-shaped rete-cells present in several (up to four) layers; in the lowermost rete layers the cells rapidly assume a horizontal position, nucleus and nucleolus become enlarged, the filling of the cells with granules rapidly increases from below upwards (granular layer) so that we often can count six rows, the prickle-cells are not present in abundance (?), the most marked cell proliferation occurs in the interpapillary prolongations, in places these are connected with one another by offshoots, by which means the papillæ degenerate into thin, thread-like prolongations and, on the other hand, passive congestion is maintained in the coils of vessels. The papillæ are elongated twelve to fifteen times the normal (?) and new-formed in places (?), their tissue infiltrated with round-cells, the coils of vessels dilated in some places, narrowed in others; in the upper parts of the cutis the bundles of connective tissue are broader than normal, and the dilated vessels surrounded by proliferated round-cells. The smooth muscular fibres are hypertrophic, some of the lymphatics dilated, the cells of the sweat-glands and hair-follicles increased and their excretory ducts filled with horny cells. In some cases there was dilatation of the sweat-glands and round-cell proliferation around their membrana propria. The hair-follicles present numerous nipple-like outgrowths.

*Diagnosis.*—Psoriasis of the scalp must be distinguished from 1. *pityriasis* or *dry seborrhœa*; this usually extends over the entire head without distinct limits, the apparently normal skin is covered with fine, whitish-gray scales; in rare cases there are circumscribed, pale-red, scaly plaques which are only distinguished from those of psoriasis by their very pale redness, slight branny desquamation, and the usual coincidence of general pityriasis of the head. 2. *Eczema*: in this there are moist patches next to scaly ones, the amount of scales is small, there is a tendency to the formation of yellowish firm crusts; it is not circumscribed and presents no circular borders. 3. *Lupus erythematosus* (Cazenave). The scales have an opaque gray color, usually are not very abundant, and are embedded in the skin; the hairs fall out in these places, and after removal of the scales the skin in the centre usually is somewhat depressed and has large pores (as if worm-eaten); depressed, atrophic, non-scaly patches of a bluish-red or whitish color are rarely absent upon the head and ears, and there are bluish-violet patches covered with thin scales upon the vermilion border of the lips. 4. *Favus* is characterized by its musty odor, gray crumbling crusts, dull look of the hairs which readily break.

Psoriasis of the trunk and limbs must be differentiated from 1. *a squamous syphilide*: this develops from brownish or copper-red, shining papules, which are usually quite elevated, and, during their involution, are covered with more or less profuse grayish-white scales. Beneath the scales of the syphilide the skin is colored brown, depressed, atrophic, and the plaque has a more sombre color, while a bright arterial redness predominates in psoriasis. While syphilis is characterized by various other forms of eruption present at the same time, psoriasis on the whole is very uniform. Upon the delicate

<sup>1</sup> Wien. Me.l. Jahrbuch, 1879, S. 67.

integument of the penis the differentiation of psoriasis from a scaly, specific patch is especially difficult. In some cases it is also very difficult to differentiate the scaly, tylosis-like syphilide of the palm of the hand and sole of the foot from the corresponding psoriatic affection. In the specific process, the brownish-red, wall-like infiltration at the borders of the scaly patches is rarely absent. Rhagades are not infrequent complications of both processes. The scaly affection of these parts produced by eczema is distinguished from psoriasis by the fact that, after the removal of the scales in the former, the eczematous change becomes visible. In addition, more recent eczematous changes may often be observed upon the lateral parts of the fingers. In some cases in which the process spreads to the dorsum of the hand, the diagnosis can only be made by the absence of psoriatic efflorescences in other parts of the body. The diagnosis is equally difficult in many cases of diseases of the nails, as psoriasis, eczema, lichen ruber, trichophyton tonsurans of the nails present the same clinical appearances.

*Chronic eczema* of the forearm and lower limbs can only be distinguished from inveterate psoriasis of these parts by the absence of the circular borders, the smaller quantity of scales, and the more marked thickening of the cutis.

Scrofulous children may present a circumscribed circular form of eczema, especially upon the dorsum of the hand, the forearm, and face. This eczema is distinguished from the nummular form of psoriasis by its elevation, slight scaling, the deeper color of the plaques, and the coincident occurrence of distinct eczematous changes in other parts.

The primary efflorescences of lichen ruber, which are rarely absent as scattered polygonal, shining, faintly colored nodules, are so characteristic that they cannot be mistaken for the bright-red, readily bleeding, primary efflorescence of psoriasis, which begins to scale very early. Upon the integument of the penis, however, the lichen nodules are arranged occasionally in the form of small circles, which are almost exactly like psoriasis, but the abundant formation of scales and the smooth structure of the base of psoriasis are wanting. Larger nodules of lichen planus are covered with few scales, have a granular surface, are infiltrated rigidly, and at the borders its composition out of individual nodules may be observed, while psoriasis scales profusely, has a smooth, readily bleeding base, and at its borders passes gradually, without any elevation, into the normal skin.

*Pityriasis rosea* is distinguished by its more rapid course, slighter branny scale formation, yellowish color in the centre, absence of hemorrhage after removal of the scales, and its localization mainly upon the thorax.

General psoriasis can only be distinguished from *pityriasis rubra* if the primary characteristic efflorescence of psoriasis can be found; the former, as a rule, does not last very long, the latter may continue unchanged for years.

In doubtful cases the patients must be examined carefully from head to foot.

*Treatment.*—No measures should be employed which give rise to injuries of the skin that heal by cicatrices, since psoriasis never heals in this manner. Recovery may be secured, 1, by internal, 2, by local remedies.

None of the measures employed is capable of preventing a relapse.

Of the large number of drugs recommended, I will mention only those which have proven useful in practice; above all, arsenic which, in fresh (*i. e.*, not yet treated) and not very extensive cases, is often sufficient to effect recovery. Fowler's solution,<sup>1</sup> with double

<sup>1</sup> Best prepared fresh and kept in a well-stoppered bottle; the drops should be carefully counted with a drop tube.

the quantity or more of peppermint water, should be administered during or after meals, in three to five doses, or it may be taken with wine. Hebra began with six drops daily and, if well tolerated, increased one drop every two or three days, up to twelve drops daily, then if recovery was delayed, increased more slowly until twenty or even thirty drops daily were administered. If the psoriatic patches began to disappear, he gradually returned to the original dose.

In larger doses, signs of arsenic poisoning appear—conjunctivitis, dryness in the throat, gastric disturbances and pains—and the dose should then be diminished. During its administration, acid, spiced articles of diet and those which are laxative, also beer should be avoided; furthermore, arsenic is contra-indicated in chronic diarrhoea and dyspeptic symptoms. Another unpleasant though not so frequent symptom of the use of arsenic is the occurrence of various eruptions of the skin; in addition, after the cure of the psoriasis, a deep brown to sepia-colored discoloration (*taches arsenicales*) often remains at the affected spots. Hutchinson<sup>1</sup> observed the development of herpes zoster during the administration of arsenic.

Hunt<sup>2</sup> begins with eighteen to twenty drops of Fowler's solution daily, divided in three doses, and remains at this quantity for two to three weeks; if no improvement occurs, he increases the dose one-fifth, and repeats this increment once or twice a month until improvement takes place. If improvement begins, he remains at the dose then given until complete recovery ensues. Attention should always be paid to conjunctival symptoms as a measure of the toxic effect.

Arsenious acid<sup>3</sup> was employed by Hebra mainly in pill form (*Asiatic pills*<sup>4</sup>), one-tenth grain in each pill. "In the majority of cases, the continued administration of three pills daily, given at one dose, immediately before a meal, proved sufficient, but in obstinate cases I have increased the daily dose to twelve pills and continued this undiminished for many months." In other cases he administered arsenic and opium.<sup>5</sup>

In addition to arseniate of soda<sup>6</sup> in pill form, Biell also employed arseniate of iron.<sup>7</sup>

By means of the subcutaneous injection of arsenious acid, Lipp<sup>8</sup> has endeavored to avoid the injurious effects of arsenic upon the stomach, and has observed rapid effects in such cases. A number of the cases treated by me in this manner showed no encouraging results, the injection is often very painful, causes moderate, occasionally phlegmon-like, suppurating infiltrations, and in addition the preparation must always be made fresh.<sup>9</sup>

<sup>1</sup> Med. Times and Gazette, Dec., 1868.

<sup>2</sup> "Treatment of Skin Diseases."

<sup>3</sup> According to Gorup-Besanez, "Anorg. Chemie," IV. Aufl., S. 281, there are two forms of arsenious acid, the crystalline and the vitreous or amorphous, produced from the former by heating and which passes into the crystalline form in the air.  $As_2O_3$  is soluble in water with difficulty (1 : 20), the vitreous modification being more soluble than the crystalline. Both are more readily soluble in hydrochloric acid and in water containing it than in pure water.

<sup>4</sup> ℞ Acid. arsenic., 3.6; Pip. nigr. pulv., 24.0; Gummi arab., Aq., q. s. ut f. pil. No. 600. To be mixed very carefully.

<sup>5</sup> ℞ Acid. arsenic., 0.06; Opii, 0.24; Sapon. med., q. s. ut f. pil. No. 16. Sig. Take two morning and evening.

<sup>6</sup> Sodæ arseniat., 0.1; Extr. hydro-alcohol. cicutæ, 1.30; M. ft. pil. 24. Sig. One to two pills daily.

<sup>7</sup> Ferri arseniat., 0.15; Extr. lupul., 4.0; Pulv. alth., 2.0; Syr. aurant. cort., q. s. ut f. pil. No. 48. Sig. Take one pill daily.

<sup>8</sup> Arch. f. Dermat., 1869.

<sup>9</sup> Vide Huseman's "Arzneimittellehre," 1875, S. 831.