# A SYSTEM OF MEDICINE

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A

# SYSTEM OF MEDICINE

BY MANY WRITERS

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VOLUME IX

DISEASES OF THE SKIN
GENERAL INDEX



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# PREFACE

THIS, the concluding volume of the second edition of the *System of Medicine*, contains the "Diseases of the Skin" which in the first edition were bound up with some affections of the Brain and Mental Diseases. This separation of diseases of a special character has been carried out elsewhere in this *System*, in the case of "Tropical Diseases" (Vol. II. Part II.) and of "Diseases of the Nose, Pharynx, Larynx, Trachea, and Ear" (Vol. IV. Part II.), with a view of meeting the convenience of readers.

The necessary changes are so extensive that this section is a rewritten rather than a revised successor to that of the first edition. By the lamented death of that most accomplished physician and scholar, Dr. J. F. Payne, the Editors were deprived of the invaluable help and advice which he freely gave in the first edition. These services have been ungrudgingly rendered by Dr. T. Colcott Fox, who has not only rewritten most of the articles contributed by the late Dr. J. F. Payne, but has provided a number of entirely new articles, and has generously lent original illustrations to other contributors. The important articles on the "Bacteriology of the Skin," "Eczema," and "Tumours" have been rewritten by Dr. Whitfield. Among the new articles contributed by Dr. Adamson are those on "Generalised Exfoliative Dermatitis," "Pityriasis rosea," "Pityriasis rubra pilaris," "Blastomycosis," "Sporotrichosis," "Calcareous deposits in the Skin," and "Diseases of the Nails." The important subject of

"Tuberculosis of the Skin" has been entirely rewritten by Dr. J. H. Sequeira, and Dr. J. M. H. MacLeod has contributed new articles on "Pruritus" and "Parapsoriasis." This by no means exhausts the list of new articles, and, moreover, the revision of the old articles has necessitated considerable alterations. The inclusion of numerous illustrations in the text should enhance the value of the volume, which it is hoped may prove an authoritative work on the subject. The Editors wish to emphasise their gratitude to Dr. T. Colcott Fox, and to thank Dr. Whitfield and Dr. Adamson for their ready help, and Dr. A. J. Jex-Blake for many corrections.

The volume contains, in addition to its index, a full index to the eleven volumes of the *System*, compiled by Dr. A. J. Jex-Blake.

CLIFFORD ALLBUTT.
H. D. ROLLESTON.

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*In order to avoid frequent interruption of the text, the numbers indicative of items in the lists of "References" are only inserted in cases of emphasis, where two or more references to the same author are in the list, where an author is quoted from a work published under another name, or where an authoritative statement is made without mention of the author's name. In ordinary cases an author's name is sufficient indication of the corresponding item in the list.*

# INTRODUCTION

By T. Colcott Fox, M.B., F.R.C.P.

I have often heard the phrase "Diseases of the Skin" criticised by members of an older generation of the profession as unjustifiable, because it must include many maladies which do not strictly come within it. If, however, it is desirable to collect together for comparison and differentiation all the disorders of the skin, the phrase may, I think, be conveniently used in the sense in which it is applied. The increasing tendency in late years to what is called Specialism has been sharply criticised, especially by the older members of the profession; and all will agree that a speciality established on an unsound basis will do more harm than good. However, notwithstanding coldness and actual opposition these special departments for special classes of disease have gradually been established at all the great teaching centres; and the electing bodies have full power and responsibility to avoid abuses by appointing to the charge of such departments only those who have acquired the essential qualification of a sound knowledge of general medicine. Unquestionably, it is to the advantage of the student that during his comparatively short attendance at the hospital he should be able to study comprehensive collections of patients with special diseases; with regard to eruptions indeed it is the only way in which he can acquire such knowledge. With regard to the teacher it may be pointed out that the workers on the diseases of the skin are now very numerous, and that there is a corresponding output of books and papers. There are no less than eleven journals entirely devoted to dermatology and venereal diseases, or to the former only; besides a vast number of communications on the same subject appearing in other publications. It is clearly impossible for any one man to keep in intimate touch with this output unless he devotes much time to the task; and, as a teacher, it is his province to digest all the current work, so that he may be sufficiently equipped to impart what is valuable to those who seek his help, and to direct the younger workers along fruitful lines of investigation. The teacher also requires time for his own original researches. At the present time the majority of the special departments of hospitals are in the charge of men who devote their whole time to their special branch of medicine, and not

of men, however able and interested, who can give a portion only of their time to it. The multiplication of these special clinics, with their army of workers trained in modern histological and bacteriological methods, has greatly advanced our knowledge; and sound teaching has disseminated a better knowledge of the subject in the ranks of the profession. A pleasant feature of the present day is the courteous exchange of the published results of research. Further, the facilities of travel in these days bring together workers from distant countries, and promote not only happy friendships and increased mutual interest in the work, but clear up much confusion in enabling observers from different schools and countries to discuss their differences over demonstrated cases. A striking example was the settlement of the conflicting opinions as to the lichen ruber of the Vienna school and pityriasis rubra pilaris of the French (*vide* p. 407).

Our knowledge of diseases of the skin, as of medicine generally, steadily advances; but there is still a host of eruptions, such as eczema, psoriasis and pemphigus, of which we do not know the cause definitely. But efforts in this direction are being steadily concentrated, and doubtless these problems will erelong yield up their secret. It would be out of place to survey in detail all the fields conquered; a few examples must suffice. Now and again diseases hitherto unrecognised, such as blastomycosis and sporotrichosis, become recognised. The main advance has been by histological and bacteriological research, and the masterly work and widespread influence of Unna in histology must be universally acknowledged. In bacteriology and inoculation experiments a striking effect was brought about by the distinction of staphylococcic and streptococcic lesions of the skin. Since the finding of the bacillus by Koch, and the definition of the pathological process produced, the progress in our knowledge of tuberculosis of the skin has been remarkable. We now know the true virulent tuberculous ulceration, the markedly infective inoculation in some cases on the hands, the attenuated forms of tuberculosis of the skin known as lupus vulgaris in its numerous phases, the colliquative form arising from the lymphatic glands in the neck, the indolent cold tuberculous abscesses of childhood, the exanthematic widespread outbursts after measles in children, and other forms. Furthermore, there is the remarkable provisional group of a number of eruptions, some described long ago, the connexion of which with tuberculosis is not yet definitely elucidated; such are the so-called tuberculides, described under such names as lichen scrofulosorum, acne scrofulosorum, erythema induratum scrofulosorum, acnitis, and folliclis. And in diagnosis and the treatment of these maladies we have the use of tuberculins and a number of other improved methods of treatment, from the Finsen light to Lang's operations. Again, syphilis, with the remarkable discoveries of recent times, such as the successful inoculation of it into certain animals, especially the higher apes; the finding and easy recognition of the causative organism; Wassermann's reaction with its various modifications so useful for diagnostic purposes, and for judging the effects of past treatment;

and lastly, the introduction by Ehrlich of "606," which in certain circumstances is remarkably efficacious, and may prove to be a true specific. One more notable example of progress made may be added. Notwithstanding the remarkable but almost forgotten work of Grüby, little was known about the fungi of so-called ringworms and favus, until Sabouraud, inspired by Besnier, took the matter in hand and in a masterly manner established the different forms of fungi at work in the production of the various forms of ringworm, and traced the origin of many of them to animals. Stimulated by his researches others have confirmed and enlarged his results. Happily, the Röntgen-ray discovery also has come to our aid, and has revolutionised the treatment of ringworms and favus; at any rate in centres where experts in the treatment are found.

An orderly classification of diseases of the skin has always been necessary and a subject for discussion. At different epochs in the evolution of our knowledge different systems have been advocated. Thus in Willan's time there was little except the objective characters to work on; and his differentiation of the elementary superficial characters of eruptions is still of value, especially to the beginner. In later times, with the improvement of the microscope, an anatomico-pathological classification was introduced, but this also had its limits of usefulness. The ideal classification is certainly the etiological, but it is still very imperfect and perplexing. However, it is well to class by this method what we do know; and, difficult as it is thus to interpret large numbers of eruptions, it shews us where we stand. Many diseases owe their origin to a definite cause, such as trauma or a parasite, whilst others, such as urticaria and the erythemas, are reactions brought about by many different causes. Other classes are, for example, dystrophies, congenital or acquired, and new growths.

T. Colcott Fox.

# THE BACTERIOLOGY OF THE SKIN

By A. Whitfield, M.D., F.R.C.P.

The study of this subject is complicated by the difficulty that the skin, from its exposed position, may present on its surface almost any kind of organism. In the earlier days of bacteriology various attempts were made by different observers to formulate a definite bacteriological flora for the normal skin; but of recent years this has been abandoned as hopelessly misleading, since many of the forms found were evidently casual, and could therefore be multiplied indefinitely. The method followed in this article will therefore be: first, to describe the organisms more or less constantly present in active growth upon the skin; and then to refer to some well-known organisms which occasionally cause cutaneous lesions. The specific organisms of the various diseases of the skin will not be described, since they are dealt with under the diseases with which they are associated.

The consideration of the more or less constant bacteria of the skin may be prefaced by insisting that the dry normal skin is not a hot-bed of bacterial growth; indeed it is remarkable how seldom even isolated organisms are seen in sections appropriately stained for the purpose of demonstrating them. The results are very different when, on the one hand, a cultivation is made by moistening the skin with sterile water and inoculating tubes from the emulsion made by scraping up horny cells, and when, on the other hand, the material thus obtained is examined microscopically. In the former case an active growth is nearly always seen, whereas in the latter it is often with the greatest difficulty that a single organism can be detected. The explanation of this difference is that on the dry normal skin a few organisms are lying as individuals, and, although alive, are not in a state of active growth. Not the least of Sabouraud's numerous services to dermatology is the enunciation of the proposition, that when an organism is found in a state of active growth upon the skin that organism is exerting its noxious effect if it has any. In certain moist areas of the skin, such as those between the toes and in the axillae, bacteria are always present in colony form, that is, in a state of active growth, but under normal conditions their only effect is to decompose the secretions with the production of a more or less definite

odour. The organisms growing in these positions are usually staphylococci of the albus type, small bacilli probably of many unnamed families, and sarcinae. *Staphylococcus aureus* is not usually present here, and, in my experience, is seldom found on the skin in any abundance unless there is either recent contamination from virulent pyogenetic infection or actual suppuration.

There are, however, three classes of organism which are found in colony form in such a large percentage of persons that they may be said to grow, if not on the normal skin, at least on the skin of the average individual. These are (1) a certain form of staphylococcus, (2) a very short bacillus, (3) an organism known as the bottle bacillus, the botanical relations of which are uncertain. I agree with Sabouraud in believing that all these, when present in active growth, form true infections of the skin with very slight symptoms.

(1) *The Staphylococcus.*—This coccus has been assumed by many to be identical with W. H. Welch's *Staphylococcus epidermidis albus.* It is, however, in my opinion a distinct organism in that it never liquefies gelatin, whereas Welch's coccus, which is probably a *Staphylococcus pyogenes albus* of extremely low virulence, is stated to liquefy gelatin more slowly than the ordinary pyogenetic staphylococci. Sabouraud has named this non-liquefying organism the *Coccus butyricus* or the *Micrococcus cutis communis*, and the latter name has gained the more general acceptance. Its characters are as follows: It grows readily on gelatin, forming greyish or buff shining streaks, and does not produce the slightest liquefaction of the medium; it curdles milk slowly, grows very rapidly on agar in creamy or buff streaks, and on potato gives rise to a brownish, slimy colony not unlike that of *B. coli.* Agar cultures evolve a smell resembling that of butyric acid. It is almost always present on the hairy scalp, but there is always some scurfiness when it is in abundance. Sabouraud considers that it is the cause of one form of pityriasis of the scalp, and with this I agree. It can also be frequently, if not invariably, obtained from the scales of so-called seborrhoeic eczema, and on this account has been named by some the scurf coccus.

(2) *The Short Bacillus.*—This organism, usually known as the micro-bacillus of Sabouraud, also as the comedo bacillus, and possibly identical with that described by some authors as the acne bacillus, is very interesting, as much confusion has arisen with regard to it. It is found in abundance in the necks of the sebaceous follicles in all cases in which these are plugged and comedo is present. In certain regions, for example, the nose and the central portion of the chin, even in cases in which we should hesitate to speak of comedo, pressure will cause the extrusion of fine worm-like threads of packed horny cells and grease. These are described by Sabouraud as seborrhoeic "cocoons" and contain myriads of the bacilli; in fact, the microscopical appearances might well suggest a pure culture of this organism. If, however, the cocoon be inoculated on to an agar tube and incubated in air there will develop a growth of staphylococci, generally of the non-liquefying variety, which will

crowd out everything else. By dividing up the thread with aseptic precautions into several portions, and implanting the deeper parts into a special acid-agar, Sabouraud has succeeded in obtaining a feeble growth of the bacillus in pure culture. Since Sabouraud's original experiments, however, it has been shewn by Hallé and Civatte that the bacillus is an anaerobe, thus explaining the difficulty previously experienced in cultivating it. The fact that culture has been obtained in the presence of oxygen may be explained in the following way: The original implantation must be made with a compact mass of the seborrhoeic filament which is so saturated with grease that air is practically excluded. Only in the central part of the mass and in that imbedded in the agar does growth take place, gradually pushing out the surrounding part of the filament and the mass of bacilli already grown, so that the centre is practically deprived of oxygen. In such circumstances it is obvious that the growth of the organism is difficult and very limited. If, on the other hand, a comedo or seborrhoeic cocoon be teased up in sterile salt solution and inoculations made, either as shake cultures in glucose-agar or by making glucose-agar plates and incubating them anaerobically, the organism may be obtained in pure culture in five or six days. In the case of the deep glucose-agar shake cultures no growth of the bacillus takes place in the uppermost centimetre of the medium, but below this there are many colonies. At the lowest point, again, the colonies will be fewer, shewing that a certain very low tension of oxygen favours the growth of the organism. Staphylococci are, of course, also present in the tube so inoculated, but these grow much more quickly and also favour the top centimetre of the medium. The colonies of staphylococci are few compared with those of the bacilli, and the impression is given that these are casual organisms which were not in active growth in the original material, this impression being substantiated by the fact already alluded to that staphylococci are not seen in masses in smear-preparations from the comedo. There is occasionally some difficulty in cultivating the bacillus on the surface of agar slopes, but when success is obtained the bacillus may either form numerous discrete colonies of an ivory white or, in some cases, may grow all along the needle track in a rather greasy-looking streak made up of numerous fine colonies which run together. I have succeeded in cultivating the bacillus for several generations, but growth in any generation comes to a standstill after about a fortnight or three weeks. Gilchrist and, later, Dr. A. Fleming described a bacillus found in acne pustules which they assumed to be identical with Sabouraud's bacillus, and which they regarded as the cause of the suppuration in acne. This bacillus grew fairly well aerobically, and Fleming's first bacillus, at all events, did not grow anaerobically. It has, however, been found by Südmersen and Thompson, and later by Ledingham and by Molesworth, that the anaerobic bacillus may be induced to grow aerobically, and it is therefore possible that it may in certain circumstances lose its anaerobic characters entirely and demand oxygen for its growth.

As to the exact part played by this bacillus in causing symptoms

some uncertainty still exists. Unna and Hodara, who first described it in comedo and acne, considered that it caused the comedo and also the suppuration, in fact the whole train of symptoms, in ordinary polymorphic acne. Sabouraud, who carried on extensive researches with the organism and was the first to grow it in pure culture, denied that it was responsible for the suppuration, but attributed to it the actual increase of sebaceous flow or seborrhoea, as well as the hyperkeratosis in the neck of the follicle which is commonly called the comedo. Gilchrist, who also cultivated from acne a bacillus, the position of which is not quite certain, stated that it was the cause of the suppuration and that he could identify the patients by the agglutination test of their serum. In my own early experiments with the organism which I managed to grow only on one or two occasions by Sabouraud's original method, I came to the conclusion that it was almost certainly the cause of the comedo, but was probably not the cause of the seborrhoea, and certainly not the cause of the suppuration. Dr. A. Fleming, who again secured from acne cultures a bacillus which he thought was identical with Gilchrist's and probably also with Sabouraud's, stated that it was the cause of the suppuration as well as of the comedo, and implied that it was also the cause of the seborrhoea. Since the cultivation and isolation of the bacillus have been rendered comparatively simple by the discovery of its anaerobic qualities, I have again cultivated it from the comedo in several cases and also from the acne pus. Experiments were carried out for me by Dr. Emery, who found that no agglutination was present in the serum from acne patients, thus agreeing with Dr. A. Fleming's results. It is always difficult to judge of the relation of an organism to a disease by opsonic and therapeutic tests, but, if any conclusion may be drawn from them, I think it is that the organism is related to the comedo but is not the cause of the suppuration, so that my conclusions are the same as they were after my earlier experiments.

(3) *The Bottle Bacillus or "Spore of Malassez."*—The position of this organism is rendered more obscure by the difficulty experienced in growing it in pure culture. Examination of the scales from a simple scurfy head (pityriasis capitis) constantly reveals a variable quantity of ovoid bodies like small yeasts scattered through the scales. Some of these organisms shew marked budding, and, in rare instances, two or three of them may be seen to be attached together by their ends so as to form a very short chain. If the scales are rather massive and are detached in a coherent sheet and cut into vertical sections, it will be seen that the organisms form a spreading layer immediately below the most superficial horny cells, occupying a position exactly similar to that occupied by the *Microsporon furfur* in pityriasis versicolor. In the driest form of scurfy head the organism may be in apparently almost pure culture, but more usually it is associated with the two organisms already described. Besides being found in pityriasis capitis, it is also present in the circinate seborrhoeic rings on the chest and back, and in many irregular forms of so-called seborrhoeic eczema elsewhere, but, after many observations, I

entirely agree with Sabouraud's conclusion that it is not found in all forms of scaly skin diseases. Thus, I have never found it in the scales of psoriasis, ichthyosis, or pityriasis rosea. Objection to the view that it is a pathogenetic organism has been raised on the score of its universal distribution, Tiéche having found it on the scalp of forty-eight out of fifty bodies examined. On the other hand, if the organism be the cause of dry pityriasis, it is scarcely surprising that it is found in so many scalps, since practically no precautions are taken against the spread of the disease, and nearly every one has a more or less scurfy head. In the very rare instances of scalps completely free from scurf I have been unable to demonstrate the organism by scraping off the superficial horny layer. We may then conclude that this organism is only found in certain scurfy conditions, and is therefore not the habitual denizen of the normal skin, and that it is not present in other markedly scaly diseases such as those already mentioned, so that it is not constantly found in all scaly affections. We are thus irresistibly drawn to the view that it is the specific organism of the condition with which it is associated. As regards its botanical position it is almost certainly a yeast, but it is difficult to see why it is so refractory to cultivation. I have on one occasion grown it in impure culture on Sabouraud's acid agar, but I lost it again in trying to plate it out in the pure state. Hare has grown a yeast which does not ferment sugars, and which is strongly suggestive of the bottle bacillus; Sabouraud failed to grow it.

In addition to the above, which are the most constant organisms found on the skin in active growth, attention should be directed to a class of diphtheroid organism which is commonly present in the axilla, and has also been found in association with the micro-bacillus in the pus of acne by Südmersen and Thompson.

Besides these organisms, some well-known organisms are frequent upon the skin, but are not found in colony form except when causing definite lesions. The ordinary pyogenetic organisms are common either as prime causes of cutaneous lesions or as secondary affections of lesions caused by some other agent. Of these, the most frequent is the *Staphylococcus pyogenes albus*. As usually present in the sporadic condition on the skin it appears to be of low virulence, and is probably identical with the coccus described by Welch as the *Staphylococcus epidermidis albus*. It is the common cause of the milder type of stitch-abscess after surgical operations; it is found in blisters of all kinds which have persisted for any time, and induces the immigration of leucocytes into them, so that the fluid changes from serum into sero-pus; it is an invariable contamination of weeping eczema, and causes any serum locked up beneath scabs to assume a purulent tendency; it is the cause of the pustules known as impetigo of Bockhart occurring at the necks of the hair follicles which have been damaged in any way, for example, by the application of irritant plasters; it is, in my opinion, the most common cause of the suppuration in acne; and a more virulent form is usually found as the causal agent of the sycosis coccogenica. The *Staphylococcus pyogenes*

*aureus* is a less common infective agent, and is usually associated with more severe lesions; thus, it is found as the causal agent almost without exception in boils and carbuncles; it is commonly present in acne varioliformis, though occasionally it is the albus variety that is met with; it is a common cause of deep whitlow, though in many cases of this disease the streptococcus is the primary infective agent; and it can usually be obtained from the ordinary infective and varicose ulcers of the leg.

The *Streptococcus pyogenes* is associated with many forms of cutaneous lesion. It is the cause of impetigo contagiosa both in its common and the circinate forms; it is also the prime infective agent of the large phlyctenular whitlows often seen complicating impetigo contagiosa, of many cases of deep whitlow with secondary glandular infection, and of the superficial ulcerative pyogenetic lesions known as ecthyma; it is the most usual infective agent in all suppurative sores accompanied by lymphangitis in the form of red streaks spreading from the initial lesion. It is also the cause of erysipelas, and of the chronic or relapsing deep lymphangitis which leads to persistent swelling of the part, and is known as elephantiasis nostras, and of many cases of suppurative lymphangitis. It is also associated with chronic infective eczema of the acanthotic type, but how far it is the actual causal agent of this form is, in my opinion, still open to question (*vide* also p. 161 *et seq.*).

The *pneumococcus* of Fraenkel has been found in some cases of deep cellulitis of the neck, of the type known as Ludwig's angina; and I have cultivated it from eczema behind the ears associated with asthma.

The *gonococcus* has been found in small abscesses in the skin in a patient who was suffering from gonorrhoea with metastases in other organs, and in some cases of ulceration.

*Bacillus pyocyaneus* has been found in many cutaneous lesions, but in most cases it is probably a secondary infection. Thus it has been found in the ulcers of fulminating ecthyma (Ecthyma térébrant of the French authors), of certain bullous diseases, among others pemphigus, in bedsores, and in infective dermatitis of the auditory meatus.

The *spirillum and fusiform bacillus of Vincent* have been found by him in hospital gangrene and noma, and are regarded by him as the cause of these diseases, at all events in certain cases.

Besides these organisms, certain bacilli usually associated with internal disorders have recently attracted attention, as they have been found in relation to cutaneous lesions. Of these the most important are: (1) *Bacillus coli communis.* This has been found in superficial suppurative skin lesions, beneath the mamma in a fat subject (personal communication from Sir A. E. Wright), in a large number of cases of chronic ulcer of the leg, and in noma. (2) The *Bacillus typhosus* is now known to be present in the rose spots of enteric fever, from which it is said to be obtainable in culture in most cases; it is also present in some of the cases of persistent sinus left after the bursting of typhoid abscesses, though in most cases these sinuses of long standing yield only staphylococci and streptococci. (3) *Bacillus diphtheriae.* It has long been known

that the diphtheria bacillus may grow on damaged skin, the so-called wound diphtheria; but of recent years numerous cases have been published shewing that the organism may cause a chronic or acute infection which clinically does not resemble diphtheria. Three main types of lesion have been described in connexion with this bacillus, namely, gangrenous patches with severe constitutional affection (and in one case albuminuria, widespread paralysis, and death), ulceration, chiefly about the inguinal region and affecting the vulva in females, and bullous eruptions simulating pemphigus or dermatitis herpetiformis. Some of these cases have been rapidly cured by the injection of antitoxin. It is of great importance that the bacilli isolated should be tested completely to establish their identity as true diphtheria bacilli, since organisms of the diphtheroid class are so commonly found in skin lesions. In many cases, however, the bacillus has been isolated in pure culture, has proved fatal to guinea-pigs when inoculated alone, but harmless when mixed with an adequate dose of diphtheria antitoxin, and such cases may be regarded as instances of genuine diphtheritic infection.

A. WHITFIELD.

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# ICHTHYOSIS

SYNONYMS.—*Fish-skin Disease; Xerodermia ichthyoides.*

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**Definition.**—A congenital developmental disease or malformation of the integument, characterised by its excessive dryness, roughness, and scaliness.

This definition is not intended to embrace the condition, frequently described as "acquired ichthyosis," which occurs in advanced life and probably results from a form of seborrhoea; nor, again, various conditions named "local ichthyosis" or "hyperkeratosis," such as arise from venous stasis, from chronic irritation in various trades, or in connexion with neuritis or disease of the central nervous system (tabes, hemiplegia, etc.). A description of so-called ichthyosis palmaris et plantaris, whether hereditary or acquired, will be found under the sub-heading of Tylosis (p. 46). On the other hand, the denomination of "ichthyosis hystrix" is retained for practical convenience, although many authors, both British and foreign,—and with reason—now group it with various forms of naevus. To the milder forms of the condition the names *xerodermia* and *xerosis* are frequently, but quite unnecessarily, applied.

In accordance with the nomenclature customary in this country, the condition usually known as harlequin fetus (fetal ichthyosis) will be first considered, as representing the gravest form of ichthyosis, although both on clinical and pathological grounds there are many reasons for considering it a totally distinct disease.

ICHTHYOSIS FETALIS GRAVIOR.—(SYN.: *Harlequin fetus; Keratoma malignum congenitale; Hyperkeratosis fetalis*).—The most exaggerated form of ichthyosis is represented by the so-called harlequin fetus, in which the marked changes resulting from deficient or perverted keratinisation occur during intra-uterine existence. The reports of no less than 42 cases have been collected and carefully analysed by Dr. J. W. Ballantyne. In almost all instances the child had been born prematurely; but there is only one record of the birth of a dead or asphyxiated ichthyotic fetus (Barkow). On the other hand, no such fetus has been known to survive more than nine days (Jahn).

A harlequin fetus presents a peculiarly repulsive appearance. Its whole integument is thickened, hardened, and split up into plates and scales by fissures and furrows of varying depth and width. The general colour is dirty greyish or yellowish; but the intersecting furrows are

reddish, purplish, or brownish. The skin is cold to the touch, and its consistence is variously described as horny, cartilaginous, leathery, pergamentaceous, and so forth.

The epidermic plates vary as to size and shape within wide limits, and may be either angular or rounded in outline. The largest are found where least movement occurs (back, arms, hands, thighs, feet); the smallest are present on the head, the front of the chest and abdomen, and about the anus and genitals. Their average thickness is from 4 to 5 mm., but in some cases they attain a thickness of 8 mm. Their outer surface is smooth or undulating, and studded with the dilated ducts of sebaceous glands; their under surface is usually attached firmly to the subjacent skin at the centre, less intimately so at the margin. When forcibly detached some bleeding may result, and a group of conical interlacing projections is revealed on the under surface of the scales and on the upper surface of the exposed cutis. Sometimes the intervening cracks are covered over by a thin pellicle; but more frequently a sanguinolent or purulent fluid, with a fetid, cadaveric odour, exudes from them.

The mouth almost always gapes, owing to the contraction of the surrounding parts; and rhagades, comparable to those of congenital syphilis (Thibierge), radiate outwards from its angles. In most cases the nose is practically absent, being represented by two apertures surrounded and blocked by epidermic plates. The eyeballs are normal, but are entirely concealed by the enormously congested, oedematous, everted eyelids. The external ears are seldom represented by more than mere tubercles. The genital organs are invariably arrested in development, and the limbs maintain their intra-uterine position of flexion, the hands and feet being greatly thickened and deformed. No abnormality has been observed in the mucous membranes, nor is there any constant abnormality of the internal organs.

The causes of death in such cases are complex. The children are originally weak, being prematurely born; this weakness is rapidly increased by insomnia (due to pain on movement), by inability to suck, by hindrance to respiration, and by suppuration in the various cracks and fissures which soon become the haunts of pyogenetic microbes; further, there is interference with the functions of the skin due to the horny investing layer, although recent investigations tend to shew that this is a less potent cause of death than has been supposed; and, finally, there are the visceral congestions and, especially, inflammatory states of the lungs and pleurae. From one or other, or from all these causes, death ensues (Ballantyne).

The only ascertained data bearing upon the *etiology* of the grave type of fetal ichthyosis are that in 7·6 per cent of the recorded cases the mothers bore more than one child similarly affected, and that close consanguinity of the parents (uncle and niece) may be responsible for one case. This condition is seldom, if ever, hereditary. Winfield reports a case in which the thyroid was absent.

Ichthyosis Fetalis Mitior.—The mild form of fetal ichthyosis forms a connecting link between the disease just described and ordinary ichthyosis. Thirty cases have been collected by Dr. Ballantyne.

The disease may be defined as a skin affection of the fetus "characterised at birth by the presence of a continuous layer of a collodion-like substance over the whole body; later by the desquamation of this substance in the form of small flakes resembling pieces of tissue paper; accompanied sometimes by ectropion and eclabium; not usually proving fatal to life, but occasionally terminating in complete or partial cure" (Ballantyne). Family prevalence is much more frequently noted than in the grave form. Most of the affected children are prematurely born, and a comparatively large number die young.

At birth, or after the removal of the vernix caseosa, the whole body is covered with a tense, dry, shiny membrane, or thin pellicle, sometimes of a dark-brown or yellowish-brown colour. In the course of a few days, as a rule, fissures and cracks form, following the lines of the natural skin-folds; and scales or lamellae of epidermis of various sizes are exfoliated, leaving a slightly moist surface. The mouth, nostrils, ears, eyelids, and genitals are affected in a manner similar to that described in connexion with the harlequin fetus, but to a less degree; and the extremities are fixed in a position of semiflexion. The symptoms resulting from these conditions are similar, consisting in difficulty of suction, deglutition, and respiration, in immobility of limbs, and so on. In the majority of the patients who attain adult life the condition merges into ordinary ichthyosis.

**Pathology of Ichthyosis Fetalis.**—The original view of Sir James Y. Simpson, that it is an intra-uterine ichthyosis, has received much more support than Ferdinand Hebra's later opinion, subsequently urged by Mr. Bland-Sutton, that it consists in a general seborrhoea. The arguments in favour of the former view may be briefly stated as follows: (i) A certain number of cases, of similar nature but milder in degree than that described, have been known to survive, and to undergo various changes in the direction of ordinary ichthyosis; (ii) ordinary ichthyosis, although admittedly a congenital disease, is not usually apparent at birth, probably on account of the prolonged soaking of the skin in the amniotic fluid, though cases are recorded in which the condition was distinctly recognised at birth; (iii) the morbid anatomy and clinical features of the two are essentially the same, the differences noted being of degree rather than of kind; (iv) in recent years several well-marked instances have been recorded of a condition ("attenuated fetal ichthyosis") which forms a connecting link between grave fetal ichthyosis and ordinary ichthyosis.

Radcliffe Crocker (11), who examined Mr. Bland-Sutton's sections, decided that the anatomy certainly resembled that of ichthyosis, and he considered the case therefore to be "a true ichthyosis congenita." This view is shared by Méneau, Chambard, and others; Darier, however, regards its histological anatomy as absolutely different from that of ichthyosis: "The stratum corneum is enormously thickened, and con-

tains less fat than normally; the stratum granulosum is greatly hypertrophied; the rete Malpighii is thickened; the papillae are elongated and irregular; perivascular infiltrations are occasionally present." Unna contends, and with many ingenious arguments, that the pathology of this condition differs wholly from that of ichthyosis. He classifies it among "stagnatory tumours," as a progressive disturbance of nutrition; he denotes it as "hyperkeratosis universalis congenitalis," and considers the predominant feature of the disease to be a congenital excessive firmness of the whole horny layer, more closely allying it with diffuse keratoma (horns) than with true ichthyosis. He lays much stress on the normal or even excessive development of the sweat (coil) glands, which in ichthyosis are atrophied.

Little or nothing is known of the epiblastic changes which result in the formation of the ichthyotic plates; but it is certain that they begin between the third and fourth months of intra-uterine life, before the differentiation of the sebaceous apparatus occurs. The suggestion advanced by Ohmann-Dumesnil, that this, as well as the milder forms of ichthyosis, are due to persistence and adherence of the epitrichial layer, is not tenable, as quite a different condition—unfortunately named "ichthyosis sebacea" (Hebra)—results from these conditions.

The **histology** of the disease has been exhaustively studied by Caspary, who found (*a*) great hypertrophy of all the layers of the epidermis, especially of the horny and granular layers; (*b*) atrophy of the true skin, which was poorly supplied with blood-vessels and deficient in connective and muscular tissue; (*c*) atrophy of the subcutaneous adipose tissue: (*d*) absence or great diminution of the sebaceous glands, with very great reduction in the number of the hair follicles; (*e*) remarkable development of the sweat glands.

ICHTHYOSIS SIMPLEX—**(Ichthyosis vera).**—*Historical.*—The recognition of the milder forms of ichthyosis is undoubtedly due to Willan, who first clearly described them and distinguished them from the severer forms of ichthyosis hystrix. Willan's description of the clinical appearances of the disease is almost complete, and his division into the two classes ichthyosis simplex and ichthyosis cornea is still valid. Alibert and Rayer in France, Hebra in Austria, Gaskoin and Erasmus Wilson in England, added considerably to our knowledge on the subject. Many additions to its literature have been made in recent years, especially in France (Brocq, Darier, Lenglet).

**Etiology.**—The causes of ichthyosis, so far as we know them, may be summed up in a word—that it is a family disease; it is generally hereditary, and often affects several members of the same family. In our opinion it is by far the most hereditary of skin affections, the only other disease comparable to it in this respect being psoriasis, also an epidermic malady. Its transmission is very irregular; Rayer (quoted by Thibierge) reports its continuous transmission throughout six generations;

but such facts are exceptional. It affects boys and girls with practically equal frequency, but has a curious tendency to pick out children of one sex in a family. One of us (J. J. P.) had under observation a family of five, of whom the three girls were markedly ichthyotic, but the two boys had healthy skins. Similar and more striking instances are recorded by Kaposi and Radcliffe Crocker. Leloir has observed twins, one of whom was ichthyotic, the other not. The disease may skip one or several generations, or may be transmitted collaterally.

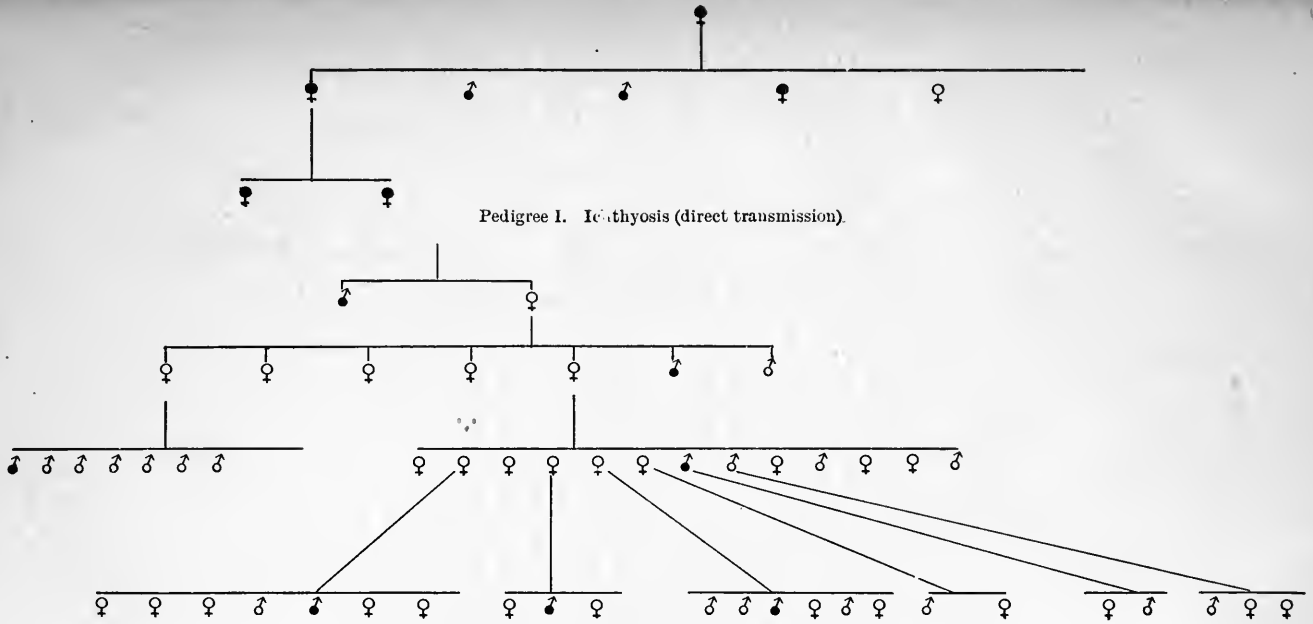
The hereditary transmission of ichthyosis is exemplified in some remarkable pedigrees published by Dr. Stainer. Transmission may be direct or indirect; in the latter case the abnormal instances are proportionally less numerous, as will be seen by a comparison of two families quoted (Pedigrees I. and III.) Female conductors tend to outnumber male conductors. In certain rare but well-authenticated records (Pedigree II.) the transmission has been limited to females. In forty-five ichthyotic families analysed by Dr. Stainer, there were twenty-seven in which no history of the presence of the disease could be ascertained in either the parents or collateral branches of the family; in this series the abnormal children constituted only 38 per cent of the offspring; whilst in a smaller series of six families in which direct inheritance was noted, the abnormal instances formed 68 per cent of the whole.

Sir J. Hutchinson (21) states that he has frequently observed ichthyosis in the children of persons suffering from psoriasis, and suggests that "it is an intensified form of psoriasis, beginning at a very early period, and deriving peculiarities accordingly"; but his observation has not been generally confirmed, nor his suggestion adopted. The only point in its favour appears to be the frequency with which the tips of the elbows and knees are markedly affected in ichthyosis. The coincidence of psoriasis and ichthyosis in the same person was recorded by Neumann, who considered his case to be unique. But other cases have since been published and seen by us.

Jablonowski states that ichthyosis of severe type is endemic among two Albanian tribes along the shores of the Adriatic; and similar statements are made with regard to Hayti and Paraguay.

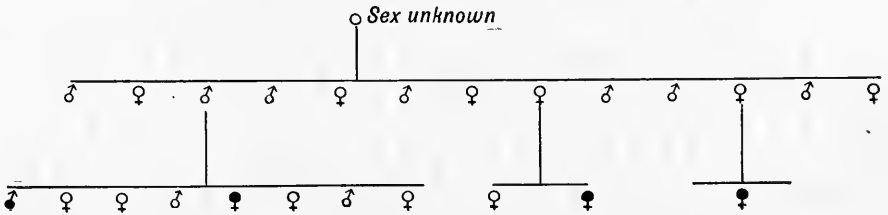
Maternal impressions and various similar fanciful reasons have been invoked to account for the occurrence of the disease.

**Morbid Anatomy and Pathology.**—Although the records of the morbid anatomy of ichthyosis simplex are curiously scanty, considering the comparative frequency of the disease, Radcliffe Crocker's statement in 1893 that it "has not yet been made out" is misleading. Thibierge cites, among other writers, Rokitansky, von Bärensprung, G. Simon, Neumann, Hebra, Kaposi, Esoff, Leloir, and Lemoine as having substantially contributed to our knowledge of the subject. Lenglet has written a very full thesis on "Dermatoses congénitales" comprising ichthyosis (Paris, 1902). The discrepancies in the descriptions of different writers are probably due to the comparison of very various grades of intensity in the cases examined.



Pedigree I. Ichthyosis (direct transmission).

Pedigree II. Ichthyosis.




Pedigree III. Ichthyosis (indirect transmission).

FIG. 1.—Pedigrees of Ichthyosis. (Stainer.)

All agree that the salient characteristics are the exaggerated production of epidermic cells, and their increased cornification and cohesion. The stratum corneum is greatly thickened, its cement substance being abnormally abundant. The stratum granulosum is diminished or absent, even in the interpapillary processes; the rete Malpighii is badly developed; the papillary zone flattened. In severe cases the hair follicles are destroyed; in milder cases they are atrophied, and their orifices blocked by epidermic masses, the hairs being wasted and twisted. The sebaceous follicles are absent, scanty, or atrophic. The sweat glands are—curiously enough—almost always normal; Esoff's description of them as greatly altered, cystic, and with proliferation of their lining membrane, is based upon the examination of a so-called "acquired" case. The subcutaneous fat is always greatly atrophied. All these writers practically agree in considering the disease as a primary disorder of keratinisation, which should be looked upon rather as a malformation than as a disease, and as one for which no reasonable explanation is forthcoming. Leloir attempted, but without carrying conviction, to argue in favour of the dependence of ichthyosis upon changes in the central or peripheral nervous system.

Several of these writers noted changes in the dermis suggesting inflammatory phenomena of a mild degree, but all apparently agree that these were secondary to the epidermic changes. Unna is of an opposite opinion, and supports his views in an extremely elaborate article, to which reference must be made for details. He considers the inflammatory phenomena, necessarily situate in the true skin, as primary; and he classifies the disease as an "infectious inflammation." He describes such marked divergences between the two principal degrees of the affection as to justify their clinical distinction; they may be briefly summarised as follows:—In ichthyosis nitida hyperkeratosis holds the field, the horny layer being much thickened; the prickle layer is thinned, and may be reduced to one or two rows of cells, which are much reduced in size, especially as to their protoplasm. The papillae are flattened. The granular layer is everywhere absent, the prickle cells passing directly into the horny cells without the formation of keratohyalin or other secondary products. The hyperkeratosis extends into the ducts of the follicles, which may be converted into hair-cysts. The sweat glands are almost invariably of normal size, but characteristic changes are always observed in their ducts, the lumen of which is dilated, and the cells hypertrophied and regularly nucleated. These changes doubtless correspond with the anidrosis and asteatosis present. The papillary layer is more cellular than normal and the cells larger; the endothelia and perithelia of all the capillaries of the skin are increased, but spindle cells are never present; there is no formation of plasma cells, and no leucocytes, and mast cells are very scanty. The collagenous (connective) tissue is thickened; the lymph spaces and panniculus adiposus are correspondingly contracted. The oblique muscles in the upper part of the corium are uniformly hypertrophic.

In ichthyosis serpentina the histological type is different. Although the horny layer is even thicker than in ichthyosis nitida, the prickle layer is well developed, its lymph spaces are wide, its cells are hypertrophied, and a well-marked granular layer develops between it and the horny layer. The inflammatory changes in the cutis are also more pronounced; cellular infiltration is more abundant, collections of plasma cells are met with at intervals along the vessels, and the number of mast cells is greater.

Upon the ultimate pathogeny of the disease Unna's researches do not throw any further light than those of his predecessors.

**Symptoms.**—In the mildest forms the ichthyotic process is confined to the hair follicles and their immediate vicinity (ichthyosis anserina vel keratosis follicularis), and represents a keratosis of the pilo-sebaceous ducts (Besnier). The skin is dry, and exhibits innumerable, closely packed, minute, firm, conical projections, which give an almost nutmeg-grater-like sensation to the hand when passed over it. Each cone corresponds to a hair follicle, and is crowned by a firmly adherent tiny scale; whilst in its centre is an atrophied, twisted hair. The lesions are commonest on the back and outer sides of the arms, and, accompanied as they often are by some redness, may cause considerable disfigurement. They are also common on the outer sides of the thighs, and occasionally affect the forehead and cheeks; but in these situations they are usually of extreme fineness.

In severer cases (ichthyosis nitida) the scales are not so limited, but form a more or less thick coating over the whole skin surface. Thibierge happily likens the condition to a layer of collodion beginning to crack. The scales, which vary greatly in size and thickness, are at first adherent all over, but gradually become detached from the margin inwards, whilst occasionally their arrangement is imbricated. When very small they desquamate like a fine white bran; when larger they usually become of a greyish or brownish tint; the skin assumes a characteristic dirty-looking appearance, and is dry and harsh; its natural elasticity is diminished, and its lines and furrows are exaggerated. Where the epidermic scales are thin and adherent, however, the skin is unduly smooth, its furrows are partially obliterated, and the appearance of a scar after a burn is simulated. In cases of still greater severity the skin does not desquamate in scales, but presents large epidermic plates having a somewhat tessellated appearance; thus it resembles that of a reptile (ichthyosis serpentina, sauridermia). The plates are polygonal, square, or lozenge-shaped, of very variable size; they are separated by deep fissures or rifts, corresponding to the natural lines of the part, and almost invariably assume a dark brownish, greenish, or even black colour (ichthyosis nigricans), owing to the decomposition of fatty matter and the adherence of atmospheric impurities.

In the most exaggerated cases (ichthyosis cornea) a condition comparable with the skin of a rhinoceros or elephant may be attained; and it is even said that in some a noise like that made by a rattlesnake can be produced by vigorous rubbing (Alibert).

The lesions always present various degrees of intensity in different situations. The minimum of intensity is usually on the face which generally shews, at most, only a few fine scales about the forehead and cheeks; but we have frequently noted, even in mild cases, a somewhat glazed appearance of the cheeks. The other parts, either exempt from the disease or nearly so, are the armpits, the bends of the elbows, the groins, the perineum, the popliteal spaces, and the genital organs, especially the penis. This is in marked contradistinction to the condition described by Brocq under the name of "Érythrodermie congénitale ichthyosique." On the other hand, the maximum of intensity is usually attained over the tips of the elbows and knees, the posterior and outer aspects of the arms, forearms, and thighs, the anterior and outer aspects of the thighs and legs, the buttocks, and the fronts of the shins; whilst the scalp is usually markedly pityriasic. In cases of doubtful diagnosis these seats of predilection should always be carefully examined. The symmetry of the disease is almost invariably perfect as regards locality, form, and severity.

The opinions of authors regarding the condition of the palms and soles vary widely. The statement, made by Unna and others, that the palms and soles are never affected is far too sweeping; as is that of Thibierge, that they are very seldom invaded. Our experience entirely confirms the statement of Radcliffe Crocker, who says: "Ordinarily the palms and soles are particularly dry and smooth, and while the major natural lines are deepened, the minor ones are absent." Besnier is of the same opinion. In many cases we are wont to liken the palms to those of a labouring man. The comparative immunity of the palms in a certain proportion of cases is undoubtedly due to the softening and separation of the scales by the free sweating which frequently takes place there, especially in summer; and the same explanation holds good of the mildness of ichthyosis in the armpits and flexures generally.

*Variants* (ichtyoses paratypiques, Besnier).—In certain rare cases the situation of the ichthyotic phenomena is different from the foregoing, or even entirely opposed to it. Thus, Thibierge cites a case of Besnier's in which the maximum intensity of a universal ichthyosis was reached in the axillae, and a number of cases have been recently collated and fully described by Brocq under the title of "Érythrodermie congénitale ichthyosiforme." It appears to us, however, extremely doubtful if this condition is a form of ichthyosis.

*Subjective Symptoms.*—These are often absent; but in a certain proportion of cases there is a peculiar sensitiveness to changes of temperature, especially to cold; and considerable pruritus is often complained of. Where the ichthyotic plates are thick there is some diminution in tactile sensibility.

By far the most important practical point in connexion with the milder forms of ichthyosis is the extreme vulnerability of the skin, which, on the most trivial exposure to heat, east wind, and the like, or without

any obvious or external irritant, is liable to severe and troublesome dermatitis or moist catarrh. The obstinacy of many so-called "eczemas" is due to this cause, and an erroneous prognosis is often founded upon imperfect recognition of this disease; or, again, the extent and persistence of such an eczematous condition, arising as it does in early life, often give rise to an erroneous diagnosis of "prurigo."

Hair is generally scanty over normally "hairy" parts, and occasionally completely absent over the trunk and limbs. Although the disease is seldom well marked on the face, the beard is usually scanty; and there is often complete alopecia of the outer parts of the eyebrows, such as occurs in syphilis.

Over markedly ichthyotic parts the secretion of sweat is usually diminished; but, on the other hand, in regions but slightly affected (for example, the palms, soles, and flexures) there is often marked hyperidrosis, and even superabundance and hypertrophy of the sweat glands, as shewn by Aubert. The relief afforded to the symptoms by free sweating in summer, and the consequent softening and removal of scales, is very grateful to ichthyotic patients as a rule; but exceptionally they feel better in winter. The secretion of sebum is diminished but not abolished, the scales sometimes feeling somewhat greasy to the touch.

The nails usually do not present any abnormality, but they are sometimes dry and brittle. The external ears are occasionally ill developed. Ichthyosis never affects mucous membranes; the condition often miscalled "ichthyosis of the tongue" is not in any way related to the disease under discussion. Ichthyosis even affects extensive scars (for example, of burns), rendering them indistinguishable from the surrounding skin.

The general development and health of ichthyotic subjects are not below the average; nor, despite the extensive cutaneous abnormalities, is albuminuria ever noted. The coexistence of asthma is not infrequent (Jamieson), becoming less aggressive if the ichthyosis improve under treatment. Ichthyotic skin, as already remarked, is peculiarly liable to obstinate moist catarrh; it is comparatively often the seat also of acne, boils, and other dermatoses due to the pyogenetic organisms which are apt to lodge in its crevices.

**Course.**—Ichthyosis is seldom well marked before the end of the second year of life, but in carefully nursed children it is generally observed in the first few months. Its apparent absence at birth has been attributed to the prolonged bathing in amniotic fluid during intra-uterine life; and the frequent ablutions to which children of tender age are almost invariably subjected undoubtedly mask the signs of the disease for a time. Cases classified as ichthyosis, but appearing for the first time after childhood, cannot be accepted as such. At about the age of ten years the malady attains its highest degree, in which phase it persists throughout life, although frequently with seasonal remissions in summer and exacerbations in winter. Reports of cases reputed to have ceased at puberty or after pregnancy are to be looked upon with suspicion. Temporary improvement may certainly occur after small-pox or any of

the eruptive fevers, but no well-authenticated case of real and permanent recovery is on record.

**Differential Diagnosis.**—The disease most apt to be confounded with ichthyosis is that described by Hallopeau and Watelet as *exfoliation lamelleuse des nouveaux-nés*, which is identical with the ichthyosis sebacea of Hebra; it is due to the persistence until birth of the epitrichial layer of cells which, in the normal fetus, is cast off at the seventh month. In such cases the child at birth is covered with a thin, smooth pellicle comparable to a layer of collodion or oiled paper; this soon separates, either in large sheets or in small scales, leaving the underlying skin somewhat branny. The skin assumes a normal appearance after a week or two, and the child's health is unaffected. The nature of the affection has been elucidated by Grass and Török, and by Bowen of Boston.

The condition described by Ritter under the title of *Dermatitis exfoliativa neonatorum* is a grave disorder, which is characterised by universal exfoliative dermatitis, occurring within a few weeks of birth, accompanied by great prostration and subnormal temperature, and usually of fatal termination (*vide* p. 177).

Mention must also be made of the simple "non-bullous" form of the type *Érythrodermie congénitale ichthyosiforme* of Vidal and Brocq. The condition is extremely rare, affects the flexor rather than the extensor surfaces, and the scales are situate upon a reddened inflammatory base; exaggeratedly rapid growth of the hair and nails is also characteristic.

**Treatment**, if persistently and intelligently carried out, although probably never really curative, is on all hands admitted to be efficacious in controlling ichthyosis. The indications are threefold: (*a*) To remove superabundant epidermis. In mild cases and in children, a daily warm bath suffices for this purpose, and the use of superfatty alkaline soaps, or the addition to the bath of alkalis, borax, bran, or starch, enhances its value and amenity. In severer cases the free use of glycerin, either pure or diluted—according to the tolerance of the patient—in the intervals of the baths usually converts the skin condition in about a week or ten days into that of apparent health, when less stringent measures may be resorted to. (*b*) To maintain the normal pliability of the skin by combating the diminution of its natural lubricants—the sweat and sebaceous secretions. In our experience the most generally convenient remedy for this purpose is glycerin, either in simple solution, mixed with 10 per cent of aqua laurocerasi, or as the official glycerinum amyli. The use of the latter may, on the ground of expense, be reserved for the face. In any case the remedy should be rubbed in with sufficient frequency and in sufficient quantity to keep the skin supple and unctuous without being sticky to the touch. Many other substances may be employed for the same purpose, such as lard, vegetable fats, cold cream, lanoline, vaseline, or soft paraffin, to which—to control itching—from one-half to one part per cent of menthol or naphthol may advantageously be added. Circumscribed excessive thickenings of epidermis may be removed by salicylic acid

either in ointment or plaster form. (*c*) To avert attacks of dermatitis, whether due to changes of temperature, to chemical or other irritants, or to the (possible) invasions of microbes. In all weathers flannel underclothing should be worn, its thickness varying with the season of the year; if pruritus be a prominent symptom the flannel garments may profitably be lined with thin washing silk. The daily use of ointments containing a small percentage of sulphur, resorcin, salicylic acid, boracic acid, or naphthol may be resorted to; or these drugs may be incorporated in the habitual lubricant employed.

There is a general consensus of opinion that internal treatment is of no avail; but Besnier insists upon the value of long-repeated minute doses of arsenic, and Brocq upon the utility of cod-liver oil. We have satisfied ourselves of the great benefit to be derived from the administration of thyroid extract, with all the due precautions now so fully recognised; and we are inclined to consider the amelioration of the skin nutrition under this drug as fairly comparable, in certain cases, to that which occurs under similar treatment in myxoedema. In some cases the use of jaborandi, or of its alkaloid pilocarpine hypodermically, is attended by temporary alleviation of symptoms.

ICHTHYOSIS HYSTRIX (*ὕστριξ, a porcupine*).—This term has given rise to much confusion owing to its use for two quite different affections (1) a severe form of ichthyosis, designated by Dr. Ballantyne, "ichthyosis hystrix gravior," to be described immediately, and (2) the various forms of linear naevi; the latter are no longer regarded as in any way connected with ichthyosis and would more properly be considered under the heading of "Naevi," *i.e.* congenital malformations of any or all of the elements of the integument. The classification which is here adopted is, however, still in customary use in this country, and is retained for the sake of convenience.

I. **Ichthyosis hystrix gravior.**—(SYN.: *Porcupine skin disease; Hystricismus; Leontiasis hystrix.*)—*Definition.*—A congenital condition in which thick epidermic plates or horny masses cover extensive papillary, wart-like growths projecting a variable distance above the surface of the skin; but in which the integument is never universally involved.

*Historical.*—The most remarkable instances recorded are those of the well-known Lambert family, in which the disease existed in four successive generations. The first member seen was described by John Machin as "an uncommon case of a distempered skin." He was the only member of the family affected, and his skin was compared to the bark of a tree, the hide of a rhinoceros, the quills of a porcupine, and so forth. His six children were all affected, the disease always appearing at the age of about two months; only one survived the age of eight years. Both father and son contracted small-pox, during which their warty growths were shed. The malady affected the male members of the family throughout four generations at least, and in some the growths were cast off at regular

intervals. A full account of all the cases, and of the copious literature appertaining to them, will be found in Dr. Ballantyne's work.

*Clinical.*—The only case in which the condition was present at birth is recorded by Ollivier; but as the infant in whom the disease was observed had been immersed in the Seine, probably for a period of three weeks before examination, the record is of very doubtful value.

In the great majority of cases the disease becomes perceptible, or well marked, at the age of about two months. In a few rare instances the skin between the warty growths has been xerodermic, or merely "not altogether healthy" (Ballantyne); but these form the only connecting link with ichthyosis vera. On the ground of cases recorded by Radcliffe Crocker and Byrom Bramwell, Ballantyne suggests that the papillary growths may arise from abrasions resulting from intra-uterine pemphigoid eruptions; but this will certainly not hold good in the great majority of cases.

The general symptoms of the disease may be gathered from the various names applied to it, and—like its morbid anatomy—may be described as an exaggeration of the far commoner condition described in the ensuing section.

**Ichthyosis Hystrix mitior.**—(SYN.: *Ichthyosis hystrix partialis; Neuropathic papilloma; Naevus zoniformis; Nerve naevus; Naevus verrucosus, linearis, unius lateris*, etc.). Several other names have been used to indicate minor differences in individual cases; of these the most unfortunate is ichthyosis herpetiformis (Hutchinson).

*Historical.*—The earliest recorded case is due to Thomson. The peculiar distribution of the lesions suggestive of nerve origin was first pointed out by von Bärensprung in 1863, and many papers on the subject have since been published, the most extensive of which is by Neumann.

*Etiology.*—Hystrix, as a rule, is not a familial disease. It afflicts the two sexes with practically equal frequency. Of its intimate pathology we have no knowledge. Sir J. Hutchinson has suggested, but without any cogent evidence in favour of the suggestion, that hystrix may be the result of intra-uterine herpes zoster. Gross changes in the central nervous system have been observed in a few cases, but their connexion with the disease in question is not clear.

*Morbid Anatomy.*—This varies widely in different cases; in all, however, there is hypertrophy of the papillae of the corium, with absence or marked atrophy of its elastic fibres; the connective tissue being lax and rich in lymph cells, while the arteries are abnormally large, and the ordinary signs of dermic inflammation often well marked. The horny layers are greatly hypertrophied, and dip deeply down between the papillae—interpapillary "acanthosis." In contradistinction to true ichthyosis, keratohyalin and eleidin are present in the stratum granulosum. The rete Malpighii is thinned and its lower layer deeply pigmented. Max Joseph describes dilatation of the sweat ducts as a constant feature, and Petersen and G. T. Elliot have recorded very similar cases in which extreme cystic dilatation of the sweat ducts

and glands was present over the affected areas ("intra-canalicular adeno-cystoma in a naevus unius lateris"). The sebaceous glands in rare instances are greatly hypertrophied.

Some cases (for example, Hallopeau's), described as originating in adult life, and ending in spontaneous recovery after varying periods, appear to us to be indubitable examples of lichen planus or plano-pilaris in bands.

*Symptoms.*—As a rule the condition is present at birth, although it frequently passes unperceived; sometimes, however, a mere dirty-looking streak, or red point, is noticed which is not removed by washing. At about

FIG. 2.—Linear lichen planus simulating linear naevus. (From a photograph lent by Dr. Whitfield.)

FIG. 3.—Naevus simulating linear lichen planus.

the age of two months the lesions become prominent and papillary; they are soft and pale brownish in colour, and their linear arrangement is already striking. The general appearance is often curiously suggestive of linear lichen planus. With increasing age the lesions extend with very various degrees of rapidity, becoming more and more extensive, harder, more prominent, and of deeper tint; finally in marked cases, they constitute warty-looking growths, consisting of elongated and thickened papillae covered by greatly hypertrophied, dark-brown or greenish, hardened epidermis. These coalesce to form pointed or flat-topped, horny or

leathery projections of variable size, which are grouped in patches or streaks, their general direction being usually transverse upon the trunk and longitudinal upon the limbs. It has been thought by various authors that the distribution of ichthyosis hystrix corresponds with (1) the distribution of peripheral nerves; (2) Voigt's lines, dividing nerve regions; (3) lines of cleavage of the skin; (4) the course of blood-vessels on the surface; (5) the segmental areas of Head; (6) the lines of junction of embryonic clefts. Of these various explanations of distribution that

Fig. 3a.—Naevus linearis unius lateris.

which ascribes them to the segmental areas of Head (or metameric lines) is the most usually accepted. The masses may project an inch or more above the general skin surface, and may have broad, truncated bases. Their general characters depend upon and vary with the predominating anatomical element in their constitution; thus they may be markedly pigmentary or hairy, or papillary, or vascular; or they may contain a great abundance of sweat glands or of sebaceous glands, as in a remarkable case recorded by Selhorst. In rare instances the lymphatic element may prevail (naevus lymphaticus). In the armpits and other hot and

moist parts the lesions are often very vascular and succulent; their growth may be extremely luxuriant, and they may bleed freely or ulcerate and vegetate, in either case secreting a peculiarly offensive fluid. The coexistence of high degrees of vascular naevus with horny and other growths may occur; a very well-marked example of this association is described and well illustrated by Gaucher. The chief inconvenience of these growths is that their horny caps catch on articles of clothing and the like, and, being thus torn off, disclose bleeding and hypertrophied papillae. The skin surrounding the streaks, or between them, is often deeply pigmented.

A corresponding condition on the mucous membrane of the cheek, palate, and tongue has been described by Sir W. Church; and on the palate alone by Ryan.

Although sometimes widely disseminated, the condition is never universal as in ichthyosis proper. In the majority of cases hystrix is unilateral and sharply demarcated by the median line; if bilateral it is seldom or never symmetrical. The disease cannot be said to have any marked seats of predilection; but the face is comparatively seldom attacked, as is the case with the palms and soles. On the other hand, a condition is described as occurring in the Island of Méleda in the Adriatic, in which there are congenital streaks of hyperkeratosis confined to the palms and soles, and which is a family disorder (Maladie de Méleda).

In a considerable number of cases severe itching is complained of; in others attacks of inflammation occur from pus infection, which result in localised eczematous changes and the shedding of some or all of the growths. The benefit ensuing is but temporary.

The general health seldom suffers; but hystrix—as is not surprising—is sometimes associated with epilepsy or other nervous diseases, or with congenital deficiencies of mind or body.

*Treatment* is usually only resorted to when the lesions are on exposed parts (face, neck, or hands), or when they give rise to disfigurement, discomfort, bleeding, or irritation. Small growths may always be controlled, and sometimes permanently removed, by free applications of concentrated salicylic collodion, or of salicylic acid plasters. Various measures may be adopted for their more radical removal, such as curetting, the use of the sharp spoon, or the galvano- or thermo-cautery; ionic medication, preferably with sulphate of copper or zinc; or the application of carbon dioxide snow: probably the last method is the most satisfactory.

For larger growths excision, where practicable, is certainly the best plan of treatment; but in many cases removal with the galvano-cautery may be suitably employed. It can usually be carried out, under cocaine, without the administration of a general anaesthetic, the growths being attacked piecemeal. In a case recorded by Max Joseph the horny growths fell off while the patient was under thyroid feeding.

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# SCLERODERMIA

SYNONYMS. — *Scleroderma; Scleremia; Sclerema adultorum; Scleroma; Scleriasis; Chorionitis; Dermato-sclerosis; Sclerostenosis cutanea; Cutis tensa chronica; Elephantiasis sclerosa; Sclerodactylitis; Morphoea;* Fr. *Sclérodermie; Sclérème des adultes;* Germ. *Hautsclerem; Sclerodermie.*

By PHINEAS S. ABRAHAM, M.D.

**Definition.**—An idiopathic affection of the skin, more or less chronic, in which the integument, in small or large areas, becomes altered in consistence and colour, hard and rigid, without inflammation, and with subsequent "hide-bound" contraction.

The first known example of this disease was described by R. Watson in 1754, from a case in Naples under Curcio. This account was quoted in full by Willan in 1808, and it still holds its place as a classical description of the disease. Willan gave it the name "Ichthyosis cornea." The condition was also fully described by Alibert in 1817,[1] under the genus "scleremia," in which he included also the oedematous sclerema of infants. He referred to 2 cases of generalised sclerodermia in adult women, and to 2 cases of "sclerema circumscriptum" in men, which were evidently instances of localised sclerodermia or morphoea.

The disease seems to have attracted but little attention until 1842, when Thirial published 2 cases under the name "sclérème des adultes." Shortly afterwards Gintrac adopted the name "scleroderma" — more correctly, as pointed out by Fagge, "sclerodermia," by which it has since been generally known. Much confusion, however, has been caused by various authors who have recorded cases under such names as "Ichthyosis cornea" (Startin, 1846); "True cheloid" (Addison, 1854); "Lèpre vitilige" (Gibert), etc. As will be seen farther on, Erasmus Wilson applied the name "Morphoea" to certain localised forms.

**Symptoms.**—In sclerodermia the most marked character is a peculiar hard stiffening and immobility of the skin, which may involve any part, and to any extent. The face, neck, scalp, arms, and the upper portions of the trunk are the most frequent sites of invasion; but the lower extremities may also be affected, as well as, in very rare cases, nearly the whole of the surface of the body. Large areas of skin may thus become diffusely and symmetrically thickened; or, on the other hand, patches of indurated integument may be irregularly scattered over large surfaces, or, more commonly, restricted to particular regions.

The cases may be thus classified under two categories :—

[1] Curiously enough, in Alibert's *Monographie des dermatoses*, 1836, I cannot find any reference to this affection.

(A) Those in which the skin changes are diffuse and symmetrical, and (B) those in which the lesions are circumscribed and irregular in distribution. In this country the latter class of cases is known under the name of "Morphoea"; and were it not that anatomically there are certain essential points of resemblance, and that in some cases both the circumscribed and diffuse lesions pass into each other, or are found in the same subject, the different clinical features might suggest their separation as distinct diseases. As indicated, both forms have occasionally been present in the same patient, and such cases have been classified as constituting a third group of so-called "mixed sclerodermia" (Crocker).

(A) DIFFUSE SCLERODERMIA is certainly a very rare disease: McCall Anderson had 2 cases in 11,000 of diseases of the skin; Crocker 2 in 10,000; the American statistics, 2 in 16,863.

A typical example was exhibited (Stowers) at the International Medical Congress in London, 1881; one at the International Dermatological Congress in London, 1896 (Stephen Mackenzie); and one, in a boy, at the Dermatological Society of London in 1898 (Pringle). Since then, other well-marked cases have been exhibited in London by Sir Malcolm Morris, Drs. Ormerod, Whitfield, Galloway, Crocker, Savill, Eddowes, and 2 by myself. As Prof. Osler has remarked, it is probable that this form of the disease comes more often under the notice of the general physician than of the dermatological specialist.

**Etiology.**—The causes of this disease are not yet known. It occurs most frequently in adult life—from twenty to forty years of age—although children, even infants in the second year, and older persons are sometimes affected. The majority of the cases have been in women. Some of the patients have put down their disease to cold and subsequent rheumatism; others to influenza, pregnancy, arrest of menses, shock, and so forth. Some authorities lay particular stress on the concomitant rheumatic pain, which is by no means an infrequent early symptom. In one of my cases the cutaneous lesions followed a fall on the shoulder, and in another there had been severe injury to the spine in childhood.

The association of sclerodermia with certain other lesions may possibly have some etiological significance. In a case shewn by Dr. Eddowes diffuse sclerodermia was associated with localised patches of morphoea, with extensive leucodermia, and alopecia. Its association with idiopathic atrophy of the skin has also been recorded (W. B. Brown, Jeanselme, Meschtschersky), and with acrodermatitis atrophicans (Kanoky and Sutton).

The frequent abnormal and irregular pigmentation has led to the suspicion of adrenal implication; and in a few instances degenerative changes have been found in one or other suprarenal capsule, or in both. Prof. Osler considers that "the deepening of the colour is only part of a trophic change in the sclerodermia, and has nothing to do with true Addison's disease." Haenel, however, has described a case in which Addison's disease was certainly coexistent.

Many cases have presented the phenomena of Raynaud's disease, both in the early and later stages (*vide also* Vol. VII. p. 139).

Moreover, its occasional concurrence with the symptoms of Graves' disease (Leube, Jeanselme, Eichhorst, Singer, Grünfeld, Osler, Leven) has not only arrested attention, but has suggested thyroid treatment. In a typical case of diffuse sclerodermia, Singer found one lobe of the thyroid much reduced and fibrous; in another Hektoen found the glandular part of the thyroid quite atrophied, and suggested a connexion between sclerodermia and arteriosclerosis and other arterial diseases. In a case of Uhlenmuth, the thyroid gland had completely disappeared. Lustgarten, having regard to the obliterative endarteritis suggesting syphilis, tried the Wassermann reaction in a case of diffuse sclerodermia, and this proved strongly positive. Whitehouse confirmed this observation and obtained positive reactions in 4 cases out of 5. The etiological significance of these results may be important.

**Morbid Anatomy.**—Unna found, from microscopical sections from a case at four different periods, that the main process was "a hypertrophy of the pre-existing collagenous bundles, which affects equally all parts of the cutis, and leads to simple pressure-atrophy of the vessels, as well as of the epidermic structures." The cellular elements were diminished, and the arteries became narrowed and cord-like, and the elastic tissue was pressed asunder by the swollen collagenous tissue and collected in bundles. The fatty tissue also disappeared, and was replaced by collagenous substance. The intradermic muscles were not atrophied. In the final atrophic stage, which Unna admits may be sometimes brought about by an obliterating endarteritis, a parchment-like, thin, cutaneous plate is left, without a papillary layer or subcutaneous tissue but with a covering of atrophied epidermis.

Other authors variously consider that a peri- and end- arteritis, leading to obliteration of the lumen, is the primary pathological change, the collagenous hyperplasia being secondary; that the lymph channels are primarily affected, with resulting stasis; that the changes in the skin are due to a perversion of nutrition analogous to myxoedema—Ehrmann regards the changes in the skin as due to an auto-infection beginning in the thyroid gland — and finally that the sclerosis is the result of a trophoneurosis (*vide* Vol. VII. p. 91). This is the view most generally held; although, as Kaposi remarked, there is at present no decided anatomical demonstration of any nerve changes. Even Schwimmer, who found disease in the peripheral nerves and warmly supported the trophoneurotic suggestion, admitted that the latter may be inferred rather than demonstrated. Dr. Mott could not find any changes in the central or peripheral nervous system in a well-marked case, but J. L. Steven, in another localised case, observed atrophy of the grey matter of the anterior horn on the same side. At any rate, most observers agree that at some period accumulations of cells are to be seen around the vessels, as well as about the sudoriparous and sebaceous glands and hair follicles, with subsequent atrophy of these structures.

This cellular hyperplasia is apparently not inflammatory. Krzysztalowicz considers that, as in idiopathic atrophy of the skin, an obliterating arteritis is the essential process. He found in two cases well-marked cellular infiltration in the subcutaneous tissue and deep layer of the corium, and also in the upper layer of the latter—especially abundant about the blood-vessels. He observed collagenous degeneration rather than hypertrophy.

**Clinical Picture.**—In many of the cases, before the characteristic alteration of the skin has become manifest, the patients have presented various prodromal symptoms — such as neuralgic or rheumatic pains, chilliness, tingling, itching, numbness, or other changes in sensation, turgescence of the skin, and eruptions of erythema, papules, vesicles, or bullae. In other cases premonitory symptoms have been absent, and the onset has been comparatively sudden. The usual course is for portions of the skin, in symmetrical positions, to become swollen and thickened, with a sensation of stiffness—the induration and rigidity gradually spreading until considerable areas are invaded, and there is obliteration of the surface lines. The skin cannot now be pinched up or pitted by pressure, nor can it be made to move freely over the underlying structures; indeed, the surface involved becomes veritably "hide-bound." The invasion of the neighbouring skin may be rapid, or the lesions may take months or years to extend. In some cases the induration has gradually "resolved" until the skin has regained its normal character; but in most of them, after a variable time, the "pseudo-oedema" gives place to a slow, atrophic contraction—the layers of the skin becoming thinner, harder, and even more immobile. The pressure from this tightening of the skin may be so great that atrophy and ulceration of the subjacent tissues may ensue, especially in prominent parts or where the integument immediately overlies any bony structures such as the elbow. The "feel" and appearance of the sclerodermatous skin have often been likened to those of a frozen corpse, of thick vellum, of leather, or of marble; and its hardness to that of a wooden board. In the early stages, the cutaneous secretions and sensation are but little interfered with; but later, both the sudoriparous and sebaceous functions may be abolished and sensation diminished. The temperature of the skin also is generally lessened to an extent sometimes of two or three degrees Fahrenheit.

The surface of the skin may at first be unchanged; or it may become glossy, or rough and scaly. Stigmata, or spots of enlarged capillaries, may make their appearance; and in some cases eruptions of vesicles or blebs (Jamieson).

The arms and the neck are often the first parts to be attacked; but the affection may appear anywhere, very rarely, however, on the palms and soles. When the limbs are affected, the joints may ultimately become absolutely fixed in semi-flexion by the hardened or contracted integument, and the fingers "clawed" (sclerodactyly, acro-sclerodermia); or, when the face is attacked, the features become "drawn" and all facial

movements impossible—the rigidity and retraction of the skin giving a terrible expression to the patient. The use of the muscles of the cheeks and lips may be so interfered with, or even abolished, that the ingestion and mastication of food become most difficult. Similarly, when the thorax and abdomen are implicated, the movements of respiration are seriously impeded; and if the "hide-bound" condition become universal the general helplessness is complete.

The nutrition of the tissues may be affected to such an extent that ulceration and local gangrene of the underlying and distal parts may result. In some few cases, the induration has extended from the neighbouring skin into the mucous membrane of the mouth, pharynx, eyelids, or vagina.

According to Thibierge, a true myositis is a frequent accompaniment; and a marked case in which most of the muscles of the limbs and body were thus affected is mentioned by Kaposi, and more recent cases by Petges and Cléjat, Rusch, Dreschfeld, Roberts, and J. A. Nixon. Its association with marked muscular atrophy has also been recorded (M'Guire, Nixon). Subcutaneous hard nodules have been occasionally observed in cases of sclerodermia.

There is always, sooner or later, some change in the colour of the integument; although at first the condition may be felt rather than seen. When fully established, and especially when contraction has begun, a waxy or parchment-like appearance is characteristic; and there is often increased pigmentation in the neighbouring skin, or even over parts at some distance from the sclerodermic integument, as well as over the latter area.

The disease may last for years, remaining stationary or slowly increasing, and death may ensue from general inanition, or more frequently from some intercurrent abdominal, cardiac, or other affection. Some patients have died suddenly without apparent cause; a few have recovered spontaneously or under treatment, especially when the process has stopped at an early stage. Instances of this recovery have occurred in my experience in the case of a man at the Blackfriars Hospital for Diseases of the Skin, and in that of a woman at the West London Hospital. In two of Sir Jonathan Hutchinson's cases, death took place from erysipelas.

Although most cases are chronic, a few have been acute in their course (Duhring, Graham, Jamieson). In a case under the observation of Sir Clifford Allbutt the disease progressively occupied the chest, lower neck, and both arms. The integument became dense, tallowy in colour, and otherwise changed according to the type. It was suspected that a slight degree of the change was perceptible in the face. There was some such disturbance of the general health as described above, but chiefly in the prodromal and early phases. The patient, an artist of eminence, was some fifty years of age at the beginning of the attack. He was so crippled in his arms as to pursue his calling with great difficulty, though, perhaps, never wholly incapacitated. After reaching its full extent the

morbid process slowly receded and gradually disappeared, so that the skin regained, or practically regained, its normal quality. The course of evolution of the integument to recovery was, roughly speaking, the inverse of the involution. The amendment seemed to be spontaneous, and could not be credited to any method of treatment. The causes of the attack could not be detected, but it was surmised that it was a neurotic perversion, and rest and tonic treatment were of course prescribed.

According to Crocker, in one class of cases, oedema instead of induration is first observed, and that authority believed that it is these only which become "atrophic."

**Diagnosis.**—The recognition of the disease should be easy, having regard to the history of the case, the characteristic immobile sclerosis, which is an early and prominent feature, and the progressive atrophic contraction.

In the early stages it has to be distinguished from the brawny, solid oedema of the legs, sometimes associated with renal or cardiac dropsy; from certain cases of lymphatic stasis, scorbutic sclerosis, myxoedema, Raynaud's disease, and from leprosy. Prof. Osler also points out that certain cases of sclerodermia which present vasomotor and trophic phenomena, extreme cyanosis associated with the infiltration, pigmentation, and perhaps superficial ulcerations, may readily be mistaken for one of the above or for some other disease.

In the later stages, when contraction has begun, confusion is just possible with neural leprosy, Morvan's disease, syringomyelia, and chronic rheumatoid arthritis; but all such cases will have their proper histories, and the hardening and contraction of the skin which any of them may present will be late and secondary in the course of the disease.

Kaposi's xerodermia pigmentosa, or parchment skin — especially the stationary type—might also be confounded with sclerodermia in the atrophic stage; but the atrophy in Kaposi's disease is not preceded by sclerosis; moreover it is an affection which always begins in early youth and steadily progresses. It is just possible, also, that lichen atrophicus may present features resembling sclerodermia.

**Treatment.**—Cases which are only in the initial stages sometimes, but very rarely, get well spontaneously; and in certain cases the condition can certainly be ameliorated, or the progress of the disease retarded, by appropriate internal and external remedies. When, however, the thickening has disappeared and atrophy becomes established, little or nothing can be done to restore the tissues to their normal state. Numerous drugs have been used in sclerodermia—mercury, iodides, arsenic, iron, quinine, cod-liver oil, belladonna, digitalis, valerian, bromides, diaphoretics—but it can only be said generally that, in most cases, tonics are indicated, such as cod-liver oil, quinine and iron; and that more important, perhaps, are good food and good air. Crocker thought well of salicin and the salicylates in the early stages. Thyroid feeding has been tried in a number of cases; results apparently success-

ful have been recorded (Marsh, Lustgarten, Grünfeld, M'Master), and also unsuccessful results (Dreschfeld, Lewin, Heller, and Osler). As Prof. Osler observes, thyroid extract has certainly not the specific action in sclerodermia that it has in myxoedema; the most that he could say of it was that in two of his cases the disease did not progress under its use. He thinks that "it may be tried without harm, and, should it fail, frictions and saline preparations should be used." Thyroid feeding certainly seemed of benefit in two of my cases—the sclerosis gradually resolving.

Externally, warm natural sulphur and other mineral waters are recommended, with Turkish baths, and massage with bland, oily substances; satisfactory results have also followed the use of electric baths or the constant current (Schwimmer, Brocq). It is most important to avoid cold or sudden chill; and, of course, any accompanying vascular or other affection must be suitably treated.

(B) MORPHOEA.—SYN.: *Circumscribed sclerodermia; Addison's cheloid; Sclérodermic en plaques.*—The name "Morphoea" had been used for blotches of leucodermia (vitiligo), and for atrophic cutaneous patches in leprosy, before Erasmus Wilson employed it to designate those patches of indurated skin ("morphoea alba lardacea") which he then thought had something to do with leprosy, but which, as Fagge pointed out in 1867, are essentially examples of circumscribed sclerodermia.

**Etiology.**—The remarks made under the sub-head "Diffuse Sclerodermia" apply here. It is more common in early adult life, although it may begin in childhood. Women of neurotic temperament seem to be especially affected.

It has followed Raynaud's disease in several cases, local irritation from a fall, friction of clothing, and the like; and in one of my patients, a lady violinist, a patch appeared on the left wrist above the thumb, possibly from the constant strain of holding the instrument. In a case of Sir Cooper Perry's sclerodermia followed a wound of the biceps. In a case reported by Cavafy morphoea developed in a long-standing patch of apparent lupus erythematosus; and in one reported by G. T. Elliot progressive muscular atrophy was present.

Most authors now accept the "trophoneurotic" view of its origin.

**Morbid Anatomy.**—Within a patch of morphoea Unna found, as the main change, great hyperplasia of the collagenous tissue; this mechanically narrowed the blood-vessels and lymph-channels, but there was no thickening of the coats of the vessels. The coil glands and hair follicles were elongated, the former with their loops separated by the intervening increased connective tissue. The papillary layer was flattened, with much disappearance of the capillaries, and great thickening of its normally fine collagenous fibres; its elastic fibres were preserved, and its lymph-channels increased in size, but diminished in number. The epidermis was but little affected. At the marginal part of the patch the collagenous hypertrophy was absent, but the connective-tissue cells were increased,

particularly along the blood-vessels. The vessels in the neighbourhood were evidently pressed upon by the growing sclerosis and the veins were dilated—thus causing the surrounding bluish zone.

In the form of sclerodermia which Unna calls "card-like," that observer found, in the early stages, changes principally in the papillary layer of the corium, which was flattened out, and in the epidermis. In the former the capillaries and lymphatics were dilated, and the connective-tissue cells were increased in number near the blood-vessels, but not in their immediate neighbourhood, and these cellular collections were abundant around and beneath the patch. The collagenous and elastic elements of the skin were not hypertrophied at this stage, the thickening being due chiefly to interstitial oedema. The epidermis exhibited great diminution of the prickle-layer and thickening of the horny layer. All this explains the depressed surface, the pearly lustre, and the increased resistance. The older patches shewed general collagenous hypertrophy, narrowing and ultimate obliteration of the vessels, and disappearance of the cellular infiltration; whilst the horny layer of the epidermis was still more increased at the expense of the prickle-layer.

Crocker examined sections of circumscribed sclerodermia in the early and late stages, and found in the former but little alteration in the epidermis; he described flattening of the papillae, thrombi in the papillary vessels, and numerous masses of cells, especially about the superficial longitudinal vessels; in the latter still greater flattening out of the papillae, and great increase of the connective and elastic tissues, with obliteration of many vessels, and atrophy of the sebaceous and coil glands.

**Symptoms.**—The circumscribed, which is far commoner than the diffuse, sclerodermia may occur in several forms:—(i.) roundish, oval, or irregular white patches; (ii.) scar-like bands; (iii.) small depressed patches, as though let in to the skin (Unna's "card-like sclerodermia"); and (iv.) raised areas somewhat resembling cheloid.

In a case of circumscribed sclerodermia under my observation there was a deep-seated oblong dermic thickening, which was only distinguishable to the touch, the surface being neither raised nor changed in colour.

The distribution is usually irregular; but more or less symmetry in the arrangement of the patches has been observed (Hutchinson and many others). The clavicular regions, the mammae, the face and neck, and the arms are most frequently affected, although the lesions may occur on any part of the body. In one of my cases morphoea was confined to one ankle. Sir J. Hutchinson lays special stress on its frequent "herpetiform" distribution; that is, following the course of particular nerves. Many cases recorded by W. Anderson, Adamson, and others corroborate this. The distribution may, on the other hand, rather correspond with the cutaneous vascular areas. The patches may be single, or, less frequently, multiple.

Morphoea generally appears as yellowish-white, waxy, or ivory-like spots, surrounded by a rosy or purplish areola. The patch may be

slightly raised above the level of the surrounding skin; hard, polished, and "lardaceous" in aspect: or it may be but little raised, slightly coloured all over at first, and becoming pale and parchment-like in the centre. The lesion can be felt as well as seen, and, except in the older cases when the induration has extended to the subcutaneous tissue, or atrophy has set in, the patch may not be absolutely immovable on the subjacent structures.

The portion of skin attacked may remain in the first stage for months or years, and involution may then set in, and the skin ultimately resume its normal state; or atrophy may take place, and a permanent contracted scar be formed, which may so involve the underlying tissues that much deformity of the part may result. This is not infrequent in *hemifacial morphoea*, which has been more than once mistaken for hemiatrophia facialis (*vide* Vol. VII. p. 167).

There is often much pigmentation, especially in the later stages; and at one time, on account of the varying colour in different cases, it was customary to speak of morphoea alba, morphoea nigra, as well as of morphoea atrophica, as distinct varieties of the disease.

Some cases begin as slightly coloured purplish spots, assuming the waxy appearance subsequently, at first in the centre. Sensations of itching, tingling, or even pain are sometimes experienced, especially at the beginning; or, on the other hand, there may be few or no subjective symptoms. Bullae rarely develop on the morphoea patches. An instance of this occurred in a female case at the West London Hospital, and other examples have been described by Hallopeau, Sherwell, and Morrow. In rare cases, also, ulcerations have ensued, as in my case just alluded to, and others under the observation of T. C. Fox, Jamieson, G. Fox, Whitfield, Morrow, and others.

**Diagnosis.**—When typical, morphoea should not be mistaken for anything else; its waxy hue, parchment-like consistence, and roseate margin being sufficiently characteristic. It has to be distinguished, however, from leucodermia, which is soft, never depressed, and of a dull white colour; from scar of burns, acne, and the like; from true cheloid, which is redder, more raised above the surface, more solid, and often with claw-like branches; from atrophic and leucodermic patches of leprosy; and from cutaneous scirrhus: I have even known a lymphatic oedema mistaken for it. The pigmented patches in one case might have been mistaken for those of leprosy, abnormal cutaneous tuberculosis, or granuloma (Darier and Gaston).

**Treatment.**—This has but little effect. Massage with emollients, cautious stimulation of the nerves, by the constant as well as by the interrupted current, may be tried; as well as, according to Brocq, electrolysis. He recommends also the constant application of Vigo's plaster. Thyroid feeding has also been tried in morphoea, and encouraging results have been recorded in a few instances. Neisser, Herxheimer, and F. Hebra have successfully employed thiosinamine injections in a few cases, and I and many other observers have seen

good results from the Röntgen rays. Bleiman has recorded improvement from the high-frequency current; and Schwerdt from injections of mesenteric gland substance.

## Sclerema Neonatorum

Synonyms.—*Scleroderma neonatorum; Sclérémie des enfants* (Chaussier); *Œdématie concrète* (Doublet); *Thirial's disease; Algor progressivus; Induratio telae cellularis; Induratio telae cellularis neonatorum; Algidité progressive* (Hervieux); *L'endurcissement athrepsique; Sklerom der Neugeborenen.*

Under the above names two diseases which appear to be distinct, occurring in newly-born infants, have been described indifferently by authors, until Parrot in 1887 pointed out their confusion.

In the one class of case—to which dermatologists, following Parrot, are now inclined to restrict the name "Sclerema neonatorum"—the skin rapidly becomes waxy in appearance, leathery in consistence, very rigid, and adherent to the underlying tissues. The whole integument may become so hardened and stiffened that all movements of the limbs become impossible. In this state, indeed, the infant resembles a dead child in rigor mortis, or a stone figure; and the likeness is heightened by the fact that there is always a fall of several degrees of temperature. The colour is generally yellowish-white, although it may sometimes be livid. The condition appears generally from the second to the tenth day after birth; but it may be present at birth, or not begin until a later period. The parts first affected are often the calves of the legs, and adipose regions, like the buttocks and thighs. A case described by Lotta Myers illustrates this fact, the induration rapidly spreading upwards to the back and the rest of the body. All functions seem to be impeded, food cannot be taken, the respiration and pulse-rate fall, and death ensues usually in from two to five days from the onset; although some patients have lingered for a longer time. Various complications may coexist, such as erythematous eruptions, ulcerations, and pulmonary and abdominal complaints. It was a case after this type which was first described by Uzembezius in 1718, and another by Underwood in 1784.

**Etiology.**—According to Parrot the cause is malnutrition following diarrhoea, pulmonary complaints, syphilitic taints, defective feeding, bad air, and so on; and it seems that such conditions have generally preceded these cases. Even in those instances in which the affection begins *in utero*—or shortly after birth—without apparent previous disease, the intra-uterine nutrition may have been at fault.

**Morbid Anatomy.**—Parrot found the integument greatly thinned and diminished in volume—especially the corium and rete layers. The stratum corneum was not affected. The fat of the corium was atrophied, and the vessels contracted, especially in the papillary layer. He con-

sidered that there was a desiccation of the skin, but no true sclerosis. A microscopical examination has also been made by Dr. Ballantyne, who observed an increase in the connective tissue.

**Treatment.**—When the sclerema is complete it appears that little or nothing can be done. Nutritious food should be administered if possible, even by syringe, and artificial warmth applied, either by woollen coverings and hot-water bottles, or by the "incubator." Rubbing with cod-liver oil might be tried. In a few partial cases recovery has taken place (Barr, Barlow, M'Dowell, Robinson).

Oedema Neonatorum.—Many of the cases described as "sclerema neonatorum" have really been instances of a solid oedema, appearing first in the legs and feet, and spreading upwards, in newly-born infants.

The subjects are as a rule feeble, often prematurely-born infants, who usually become drowsy before the affection is manifest—which is generally a day or two after birth. The skin becomes cold, swollen, and hard, pitting with some difficulty; and the surface tense, glossy, and of a reddish or livid colour. As the oedema spreads upwards the swelling may diminish in the regions first attacked—leaving the skin thinner, hardened, and wrinkled. The immobility of the skin and the stiffening of the joints are much less than in the true sclerema neonatorum.

In the usual course the child dies in from two to ten days—the temperature gradually falling, and all the functions becoming obsolete.

**Anatomically,** no cellular infiltration or connective-tissue hypertrophy has been found, but only an increase of oedematous fluid in the corium and subcutaneous tissue, and an increased and altered fatty deposit in the latter. According to Dr. Ballantyne, the condition is analogous to adult anasarca from renal, cardiac, or pulmonary disease. The proximate cause, as Kaposi observes, is no doubt a retardation of the capillary circulation—from cold, feeble action of the heart, or thrombosis; and the remote causes may be disease of the heart, lungs, or digestive system; or malnutrition from syphilis, bad food, and the like.

The disease seems to be more common on the continent of Europe than in this country.

The **treatment** is the same as for sclerema, and it is said to be occasionally successful; namely, warmth, promotion of the circulation, and careful nourishment.

Phineas S. Abraham.

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## CHELOID

SYNONYMS.—*Keloid, Keloid of Alibert; Chelis, Kelis; Cheloma; Cancroid, Fatty tetter; Cancroïde, Dartre de la graisse; Knollenkrebs.*

By P. S. ABRAHAM, M.D.

**Description.**—The name cheloid is applied to certain non-inflammatory, long-standing, tough, fleshy excrescences; smooth or nodulated, oval or elongated; and often with "claw-like" prolongations.

The lesion was first recognised and described by Alibert, in 1810, under the name of "Cancroïde"; he placed it in a somewhat intermediate position between the "dartrous" and "cancerous" affections, because he thought on the one hand that the tumours sometimes exhibited a furfuraceous desquamation, and on the other that their growth was sometimes accompanied by acute and lancinating pains, as in "cancer." The name, however, was founded upon the bifurcating prolongations, like the claws of a crayfish (écrevisse), which frequently protrude from their borders.

Alibert subsequently, with the same notion, adopted the name

"Chéloïde" (from χηλή, a claw);[1] and he then included under the one generic name of "Chéloïde" two forms or "species," which he distinguished as (A) "True cheloid," and (B) "False cheloid"; the former being "ardently pruritic and painful," the latter "indolent, and the result of a cicatrising inflammation after a burn or ulceration."

Considerable confusion was many years afterwards (1854) caused by Addison using the name "true cheloid" to designate a very different affection; namely, sclerodermia.

Until comparatively recently the view was generally held that there were really, as Alibert taught, marked distinctions between the "true" or "idiopathic cheloid," which was supposed to arise spontaneously, and was more painful and more lasting, and the "false cheloid," which formed in scar tissue, and was called by Dieberg, in 1852, "cicatricial cheloid." Sir J. Hutchinson, in 1870, threw doubt upon the then prevalent view; and since the report of the committee appointed to consider a case exhibited by Dr. Goodhart, at the Clinical Society of London, in 1880, the opinion has been gaining ground that there is really no essential difference between the so-called "true" and "false" cheloids. The committee came to the conclusion that the supposed spontaneous cases had probably occurred after a solution of continuity or scarring of the skin, slight as it might have been; and they recommended that the qualifications "true" and "false" be discarded.

**Etiology.** — Why some skins, after the slightest injury, should degenerate into cheloid is not known. To call it a peculiar idiosyncrasy is not to explain it. Not even a microbe has been as yet demonstrated in these tissues.

Cheloid may occur at all *ages*; in one case which was congenital (8) Fagge suggested a previous intra-uterine skin lesion; older infants are occasionally affected, and children of various ages: it is commoner, however, in adult life, though rare in old persons. The sexes seem to be equally liable to its occurrence.

Climate has no etiological bearing upon it; but race perhaps has, for it is frequently seen in negroes (Fig. 4).

Hereditary disposition has been indicated in some cases, and instances are on record of more than one member of a family becoming affected (8, 9, 15, 35).

**Morbid Anatomy.**—All authors agree that cheloid is an acquired, circumscribed, connective-tissue or collagenous neoplasm arising in the corium, and, as a rule, not extending into the subcutaneous tissue or papillary layer. Sections taken from the younger growths exhibit an increased vascularity and a hyperplasia of fibrous elements, fusiform cells, and bundles of fibres—chiefly in the neighbourhood of the vessels. In older growths the collagenous hypertrophy may become so extreme

[1] This is the only derivation that concerns the reader; the *k* being regarded as interchangeable with *ch*. Addison, however, formed the word upon κηλίς (a mark), and others perhaps upon κήλη (a tumour). The authoritative *Nomenclature of Diseases* (1906) adopts *ch*.—ED.

that the vessels and other structures are contracted or even atrophied; and the mass comes to be made up almost entirely of dense, white, tendinous, fibrous tissue; the bundles lying mostly parallel to the surface, and to the long axis of the tumour. As the tumour increases in size, it may compress and push aside the neighbouring unaltered parts of the corium, and so become imperfectly encapsulated. The surrounding vessels, which may be increased in number, and those of the spurs, are accompanied by round and spindle cells; so that the opinion is now prevalent that the growth mainly has its origin in perivascular fibrosis.

Kaposi and others have maintained that there are histological differences between the "true" cheloid, the "cicatricial" cheloid, and the "hypertrophic cicatrix": that in the first the papillae and the interpapillary prolongations of the epidermis are unaffected; in the second the papillae are absent in the centre, but present at the periphery; and in the third the papillae are quite absent. The arrangement of the fibrous bundles was also said to be looser and more irregular in the two latter, and the epidermis thinner. These distinctions have not been always observed; and it may be pointed out that, supposing the new growth to start in a very minute cicatrix, the subsequent sections of the growth which has extended in the surrounding normal corium would scarcely exhibit the irregularity of formation, absence of papillary layer, and so forth, to be anticipated in cheloid growing in a larger scar, after perhaps some considerable loss of substance and imperfect replacement of the original tissues.

**Clinical Features.**—The cheloid growths arise as small, reddish, papular indurations, which gradually increase in dimensions in one or more lateral directions; or, occasionally, neighbouring spots may coalesce, until raised masses are formed which are ovoid, irregular, plate-like, band-like, or cord-like in shape; and often, at one or both ends, they present characteristic radiating extensions, simple or branched, which may be continuous with secondary bands passing across the growths. Their consistence is hard and cartilaginous, and their colour often pink or rosy, but occasionally of a darker purplish or brownish tint. When large, they may be flattened or depressed in the centre; and the edges in places may somewhat overhang the neighbouring skin. The surface is usually smooth and shiny, and arborescent blood-vessels may be seen upon them, especially near the borders. After attaining a certain size, in the course of months or years, they may remain stationary for an indefinite period; or become partly or wholly softened, shrunken, and wrinkled, and either disappear entirely, or leave a depressed cicatrix behind.

Cheloid in the young, and the so-called hypertrophic cicatrix, and that following syphilis, tuberculosis, and the like, have a greater tendency to spontaneous cure than the older, harder, and more long-standing cases. Those occurring after syphilis are said to be softer, less liable to encroach on the neighbouring skin or to produce spurs, and to be more prone to ulcerate.

These growths are often tender, or may even be very painful, with

pricking, itchy, and shooting sensations. Their most common situation is over the sternum, although they may form on other parts of the trunk, neck, and head, and indeed on the site of cutaneous lesions on any part of the body; although more rarely on the limbs. Cheloid tumours may thus be single or multiple.

They arise in the scars of burns, cuts, and abrasions, ear-ring punctures (Fig. 4), after caustics, blisters, flogging, leech-bites, tattooing, syphilitic lesions, leprosy, furuncle, acne, lupus, scrofulodermia, vaccination, small-pox, prickly-heat, herpes zoster, psoriasis, morphoea; or, indeed, after any other affection of the skin which might cause the slightest scar. In a case of pruritus under my care, multiple cheloid tumours, some of them large and almost pedunculated, appeared on the legs as a result of the scratching.

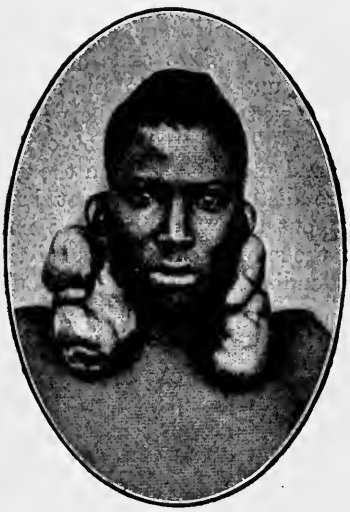

FIG. 4.—Cheloid of the ears.

Cheloid very rarely ulcerates; but, in a remarkable case recorded by W. Anderson, that process set in, and the growth ultimately became malignant; and in one exhibited by myself several large nodules shewed extensive ulceration.

Cheloids are occasionally so vascular that an erectile character has been observed.

**Diagnosis.**—As a rule, there should be but little difficulty in recognising cheloid. A raised sclerodermic patch might perhaps be mistaken for it, but there would be no prolongations, and the colour and texture would be different (see "Sclerodermia," p. 36). Cutaneous sarcoma or carcinoma might resemble it superficially; but the more rapid growth of these tumours, their tendency to ulceration, and the general history of the case, should be sufficiently distinctive. Myoma and fibromyoma are also possible simulators, but the softer texture and general appearance, as well as the clinical history, should decide the case.

**Treatment.**—Excision has been often tried, and very generally without success; for even when the growth has been widely removed recurrence has taken place, and more extensively. An occasional good result has, however, been recorded (Erichsen).

Caustics, and indeed any irritating applications, may also have disastrous effects. The growths were seen, in one case, to shrink under the application of ice (29) and of elastic pressure. Brock recommends the long-continued application of Vigo's plaster; and endorses the value of Vidal's frequent deep scarifications, not only in permanently relieving the severe pain, but, if continued long enough, in removing the new growth;

he also, like Hardaway, claims to have had good results with electrolysis, which he sometimes alternated with scarification. Beneficial results have recently been obtained in my hands from the use of *x*-rays and radium, and by Dr. Knowsley Sibley by Bier's suction cups.

Internal medication so far has not had much effect on cheloid; but it may be necessary to give opiates and inject cocaine, etc., for relief of the pain.

ACNE CHELOID (see p. 193).

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## THE HYPERKERATOSES

By P. S. Abraham, M.D.

In many diseases of the skin a hypertrophic development of the corneous layer of the epidermis takes place. Those in which this process appears to be a very prominent feature may be conveniently considered together under the head of "keratoses." This group should include, besides those about to be described, ichthyosis, lichen pilaris, verruca, and many other dermatoses; but as most of them are elsewhere described in this work, I shall here specially allude only to tylosis, keratosis palmaris et plantaris, clavus, and cornu cutaneum.

Tylosis.—Syn.: *Tyloma; Callus; Callosity; Callositas; Durillon; Ichthyosis palmaris et plantaris; Keratoma; Keratodermia.*—**Definition.**—A hypertrophic condition of the horny layers of the epidermis of parts subjected to prolonged but intermittent pressure, or friction; or due to other local irritation.

The name "tylosis," in this restricted sense, thus includes all the more or less circumscribed and local epidermic thickenings or keratoses, without papillary hypertrophy, which in certain trades and occupations may appear on the hands, or elsewhere; and on the feet from the pressure of shoes, boots, or sandals, or of standing or walking; as well as those resulting from prolonged contact with alkalis, acids, or other irritating substances; or, again, the sequels of certain local, chronic, irritative diseases.

The epidermic thickenings are practically the same in all these cases—tough, hard, horny plates, of a yellowish colour; merge at the edges into the surrounding skin; when removed they appear to the naked eye homogeneous and translucent.

The localised or circumscribed formations which are the result of intermittent pressure and friction are frequently to be seen on the palms of the hands in workmen, and are commonly called "callosities." The trade or occupation of the patient can often be determined from the particular situation of the callosity.

Tylosis is usually painless, and may give rise to little inconvenience, unless it be from some dulness of sensation, and from interference with the suppleness of the integument. Deep, painful fissures, however, may form in the hard, unyielding skin, and the underlying and surrounding corium and subcutaneous tissue may sometimes become inflamed. If wide suppuration ensue, deep necrosis may result, and the thickened epidermis may be cast off.

A condition of tylosis of the palms and soles may follow or accom-

pany long-standing eczema, psoriasis, lichen planus or ruber acuminatus, pityriasis rubra pilaris, syphilis, and so on; but in many of such cases the thickening may be more generalised over the plantar and palmar surfaces, and there is more implication of the other elements of the skin. Although in these cases standing in no primary causative relation, pressure and friction will enhance the condition. These are more akin to the cases alluded to under the head "Keratosis palmaris," etc.

Tylosis is sometimes accompanied by hyperidrosis, and, the orifices of the sweat ducts becoming partially occluded, a sodden condition may ensue. This is not infrequent in the soles of the feet in shop assistants who have much standing.

**Morbid Anatomy.**—The chief feature is the increase in bulk mainly due to a hypertrophic condition of the horny layers of the epidermis—the cells becoming condensed or "welded" together, and the superficial ones not being shed as in the normal state. According to Unna, the process is a pure hyperkeratosis — not an acanthosis or hyperplasia of the prickle-cells—with subsequent cornification. Indeed, the Malpighian layer of the epidermis, the papillae, and other parts of the corium are not primarily affected; they only become involved in an ensuing inflammation. Corns, one or more, often form in the area of a tylosis of the foot.

**Treatment.**—When troublesome, the hard epidermis can be pared away, after softening with warm water, water dressings, or poultices; or treated with certain substances which soften or destroy keratinous tissue. Dilute solutions of caustic potash may be painted on frequently; or acetic acid; or, better still, soft soap in solution or ointment may be kept applied; but the most efficacious means of destroying the hardened epidermis is the application of salicylic acid in 10-20 per cent plasters, or as a collodium paint of similar strength, kept on until the desired effect is produced. In these plasters or paints it is advisable to incorporate cannabis indica, creosote, or carbolic acid to alleviate any pain which may be caused by the application.

The application of solid carbonic anhydride, after paring off as much as possible of the thickened epidermis, has recently proved efficacious in some cases. The most important indication, however, in the treatment of all cases is the abolition, if possible, of the immediate cause—that is, the friction or intermittent pressure; otherwise the hyperkeratosis will certainly reappear.

When the epidermic thickening is associated with eczema, syphilis, and other diseases, these must, of course, be suitably treated; and, as with the simpler cases, avoidance of pressure and irritation must be enjoined.

OTHER HYPERKERATOSES. — Those hyperkeratoses which are congenital, idiopathic, or without any apparent local cause, those which appear after the ingestion of certain drugs, as well as those obviously trophoneurotic cases which may occur in the course of central and

peripheral nerve diseases, may be considered apart from the tyloses resulting from local causes.

Keratosis Palmaris et Plantaris (Keratoma Palmare et Plantare) is important. Thost first called attention to this condition in 1880. In the instance recorded by him, four generations were affected. Other cases have since been described by Unna (1883), Hyde, Dale, Crocker, Jacob and Fulton, Gossage, and many others. In Dr. Gossage's case two boys and two girls were affected in a family of seven children, and there was a history of the affection in the mother's father and grandmother. At the British Medical Association meeting in 1910, Dr. Reynolds shewed a family of five children with the abnormality, the mother and maternal grandmother being similarly affected. In many of the above cases the keratosis was diffuse and plate-like, the palms and soles being greatly thickened and horn-like, sometimes rough and salient on the parts subjected to pressure, but more often smooth on the surface.

The recorded instances of these symmetrical keratoses differ in their clinical characters, and several attempts by Besnier and others have been made to classify them. It must, however, suffice here to enumerate some of the principal forms: (1) The congenital keratodermia, always symmetrical, hereditary, and accompanied by papillary hypertrophy—as first described by Thost. (2) Symmetrical keratodermia, developed in childhood, erythematous and irritable. Besnier believes this to be connected with some neurosis. (3) Symmetrical keratodermia of the plantar surfaces, which begins in isolated multiple patches (Besnier). (4) Keratodermia erythematodes ("erythema keratodes" of Brooke), which has a marked erythematous base. (5) "Maladie de Méleda"—endemic and hereditary cutaneous hypertrophies occurring on the hands and feet and sometimes on the legs and forearms—often seen in the inhabitants of an island off Dalmatia (Hovorka and Ehlers, and Neumann). (6) Multiple painful keratosis of children, with development of cutaneous horns. Two cases have been under my care at the West London Hospital. In neither was there any history of anything of the kind in other members of the family. The first case was that of a girl aged five, with a number of localised horny thickenings on the hands and feet, some of them on the dorsal surfaces, two or three on the trunk, and one on the thigh. Several had developed into cutaneous horns, and were painful to the touch. The second was in a boy aged nine, whose growths were still more prominent and exquisitely painful. They were entirely located on the hands and feet.

The keratodermias of leprosy and other diseases, in which, as perhaps in some of the foregoing, we may suspect some central or peripheral nerve lesion, and which are therefore essentially trophoneurotic, may here be mentioned, as well as the so-called "perforating ulcer," so often associated with tabes, diabetes, leprosy, and other diseases; in these there is usually a pre-existing callosity. (*Vide* art. "Trophoneurosis," Vol. VII. p. 82.)

Keratodermia arsenicalis, which may appear on the palms and soles after prolonged ingestion of the drug, and may clinically simulate the idiopathic keratoses, is referred to more fully on p. 105.

In many keratoses hyperidrosis may be a prominent and early symptom, and other parts of the skin besides the epidermis may be more or less changed.

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Corn.—Syn.: *Clavus; Spinae pedum; Cor; Durillon aux pieds; Œil de perdrix; Hühnerauge.*—A corn is a localised tylosis occurring in particular situations, where there may be intermittent pressure from without and solid resistance from within.

The hypertrophied and hardened horny layers of the epidermis form a sub-conical mass, slightly raised on the free surface, with its apex pressing upon the papillary portion of the corium, and so causing pain and often inflammation. The central part of the corn is usually the most dense and hardened—the so-called "core"; and, as long as the conditions obtain, its lower surface is constantly being added to by the formation of new cornified cells. This downward growth may lead to atrophy of the papillary layer, and deeply indent the corium. The peripheral parts of the corn are less dense, and beneath them the papillae may be normal or hypertrophied.

They commonly grow on the upper surfaces of the joints of the toes, wherever there is friction or pressure from the boot or shoe; on the plantar eminences; on the ball of the big toe, upon which there is most pressure from the leather sole; and on the sides of the toes when these are squeezed together. The last named, except on the outsides of the little and big toes, are the so-called "soft corns," the hypertrophied epidermis being softened to some extent by the natural moisture of the parts; they often shew a central harder depression on the surface (œil de perdrix) representing the upper end of the core.

Unna finds that in the "core" the sweat ducts may be lost; in the rest of the corn they are dilated.

The surrounding skin is often hyperaemic; and haemorrhages may take place in the corn itself from rupture of the papillary capillaries.

The growth of a corn may be so extensive as to cause atrophy of all the underlying tissues, with inflammation and suppuration in the neighbouring structures.

As might be expected from its formation and situation, when the corn is inflamed the slightest pressure upon it causes great pain, which is occasionally mistaken for that of gout.

When the horny layer is hypertrophied over a bursa, the so-called "bunion" is the result, and the inflamed synovial sac may require more serious surgical treatment.

Corns seem to be peculiarly hygroscopic, and on the approach of rain are apt to become swollen and painful.

**Treatment.**—By careful scraping and cutting, the hardened epidermis, including the core, can be wholly removed without injury to the surrounding parts, with or without previous softening in warm water; but this requires expert manipulation. The best method of treatment in ordinary circumstances is first of all to remove all pressure by a large "corn plaster" or isolating ring, and to wear properly fitting boots; and, secondly, to soften and remove the corn by the application of salicylic plasters or paints, as recommended for tylosis. After each renewal, every day or two, of the plaster or paint (which should not extend over the neighbouring skin), as much of the softened and swollen epidermis as possible must be scraped away; and in less than a week the corn should be gone. Short boots, as in growing children, are very apt to produce corns. Soft corns can be cured by soft soap on lint kept between the toes, or salicylic wool maintained in the same position. Boots and shoes with pointed toes are their principal cause.

CORNU CUTANEUM.—SYN.: *Cornu humanum; Keratiasis; Ichthyiasis cornigera; Ichthyosis cornea.* Fr. *Corne.* Germ. *Hauthorn.*—**Definition.**—Horny epidermic outgrowths from the skin, arising from a papillary base, and resembling in some measure in structure the "horn" of the rhinoceros.

The occasional occurrence of "horns" growing from the human integument attracted attention in very early times. They are certainly very uncommon now.

In 1791 Sir Everard Home brought the subject before the Royal Society, and he discussed a number of cases which had been recorded before that time. Erasmus Wilson also considered these peaks at length, and later a Committee of the French Academy of Medicine collected all available information on the subject. More elaborate investigations into their nature were published by Lebert in 1864, who gave references to 109 cases. In more than half the cases hitherto recorded, the horns have developed upon the scalp, forehead, and temples—chiefly in the first situation; but they may occur on the thighs, legs, penis (chiefly on the glans), and indeed upon any part of the body.

I have seen a cutaneous horn developing upon the edge of a broken-down sebaceous cyst which was becoming epitheliomatous, in a man of fifty-five; others in connexion with localised tylotic growths in children; and one very remarkable one, $2\frac{1}{4}$ inches long and as thick as a quill, growing from the side of the penis in a young married man (Fig. 5).

It had broken off several times and grew again; but was permanently removed by free excision.

Old persons seem to be more liable to their formation than the young, although there are cases on record in which they have appeared in early youth.

A slight majority of the cases have occurred in women. In shape they are elongated and conical, with an ovoid, roundish, or angular cross-section, or sometimes they are short and stumpy; the longer ones are usually curved or twisted; or they may be spiral, like a ram's horn. They have been known to attain a length of 14 or more inches, but, as a rule, they are much smaller. In one case a large horn with a broad base, 14 inches in circumference, very soon divided into three large branches. Their surface is generally rugose, with transverse ridges and longitudinal striae; and their colour varies in different shades of grey, yellowish, brown, greenish, or black. The outer layers of the horn may be hard, but are nearly always softer than true horn; and the central parts may be still less dense in consistence. Although generally tough, they are occasionally brittle and friable. The surrounding skin may be hypertrophic, with raised margins overlapping the base of the horn; that is, the latter may seem to be set deeply in a sulcus which surrounds it.

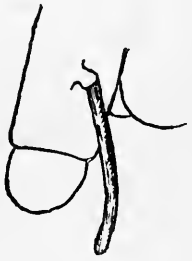

Fig. 5.—Cutaneous horn on the penis.

The growth is generally slow and intermittent, although at first it may be somewhat rapid. After attaining a certain size the horn may be broken or fall off; but in this case it is usually soon reproduced.

In most instances there has been but one horn, but sometimes—10 per cent of the cases, according to Lebert—they are multiple.

When the horns are very numerous the case may easily be mistaken for one of false ichthyosis.

**Pathology.**—Cornua cutanea were at one time (Home, Astley Cooper) supposed to arise principally from sebaceous and atheromatous cysts, and Lebert and Wilson warmly supported this view; the probability, however, is that they develop more frequently from warty conditions (Malpighi, 1685, Morgagni, etc.). They may also arise from fibromas, and occasionally after some trauma.

In structure the cutaneous horn is mainly epidermic, but elongated papillae may extend from the corium far into the base. It has been regarded, indeed, as being virtually an aggregation of acuminated warts.

The hard tissue is chiefly made up of columns of horny cells, the latter being arranged in an imbricated manner (Lebert). According to Unna, cutaneous horns are "papillary and medullated keratomas growing upon a warty base."

**Treatment.**—The most radical method of treatment is by free excision, or the horn can be cut away or torn off from its papillary base, and the latter freely cauterised with acids or alkalis, nitrate of silver, or chloride

of zinc. Thorough destruction or removal of the underlying papillary layer is essential, not only to prevent a recurrence of the growth, but also in view of the possible development of carcinoma. Many cases have been recorded of cutaneous horns becoming cancerous at their base.

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# CONDITIONS TERMINATING IN NECROSIS OF THE SKIN

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THE conditions producing necrosis of the skin are due to very many causes, and are dealt with under different headings in works devoted to general medicine and surgery. There are obvious reasons for considering the subject of necrosis from the point of view of cutaneous medicine.

The causes of necrosis of the skin are rarely simple. Even in the case of direct mechanical injury the ultimate destruction of tissue may be due, in less degree, to the death of the protoplasm so caused than to the noxious influence of pathogenetic organisms, to which the injured tissue so readily becomes a prey; so also in the case of the necrosis of tissue producing bedsore, no doubt due to continued pressure of the affected surface, there are also to be considered the influences of ready infection by pathogenetic germs, and the remarkable loss of vitality—the so-called trophic influences—giving rise to some of the most severe forms of this condition. For the purposes of considering the subject in some order the following classification will be of service:—

**Classification of Causes of Necrosis of the Skin.** — 1. Trauma, including mechanical injury, chemical action, heat, cold. These injuries may be accidental or self-inflicted.

2. Virulent bacterial invasion of the skin, as in dermatitis gangrenosa infantum and noma.

3. Alterations in the means of blood supply to the skin : (*a*) Pressure on vessels from the exterior, as by tumours and exudations ; (*b*) alterations in the calibre of vessels, owing to changes in the muscular coat, *e.g.* temporary spasm as in Raynaud's disease, long-standing contraction as in ergotism, or paralytic distension ; (*c*) diminution of the calibre of vessels, owing to changes of inflammatory or degenerative character in their walls, as in the endarteritis produced by syphilis, and the degenerative arterial changes of atheroma and arteriosclerosis ; (*d*) obstruction of the lumen, as in various forms of thrombosis and embolism.

4. Changes in the composition and quality of the blood, as in the conditions leading to purpura, in certain forms of peripheral cyanosis, and in diabetes.

5. Disease or injury of the central or peripheral nervous system, as in syringomyelia, in leprosy, and in the necrosing lesions of herpes.

A detailed consideration of the morbid states suggested by this classification is not necessary in this place. Many of them have been already fully dealt with in preceding volumes of this work. It is advisable, however, to take some special notice of some of the diseases falling into this category.

**Multiple Gangrene of the Skin.**—Syn. : *Erythema gangrenosum ; neurotic* or *spontaneous gangrene ; Pathomimia.*—This condition is characterised by the production of areas of necrosis of the skin, preceded by erythema and vesication. The multiplicity and recurrence of the lesions are very characteristic features ; their apparently spontaneous appearance has given rise to the hypothesis that they are of nervous or neurotic origin. This disease of comparatively rare occurrence is one which, under different names indicating its characteristic features, has given rise to much discussion. Usually the course of events is that patches of erythema, commonly with rounded outlines, appear without obvious cause on the surface. On these erythematous patches vesicles may develop. The vesicles are occasionally abortive ; on the other hand, they may develop into well-defined tense bullae. Healing, followed by a certain degree of superficial cicatrisation, not infrequently occurs after this stage has been reached. Many cases, however, present destruction of the deeper skin and gangrenous lesions, which give rise to rounded or "punched out" ulcers. These finally heal, usually after considerable delay, leaving rounded scars conforming to the shape of the ulcers.

The number of cases of this condition now on record is considerable. The more mysterious examples are occasionally reported, or find their way for purposes of diagnosis and demonstration to the neurological and dermatological meetings of medical societies. The majority of cases, though somewhat difficult to account for, are readily discovered to be of artificial origin ; and even of those more mysterious in their causation it may be doubted if any one has not been finally traced to some factitious cause. Most of the cases have occurred in women, or in men displaying evident

hysterical or neurotic manifestations. In certain cases they have been definitely produced for the purposes of exciting sympathy, extracting charity, or for some of the many causes of malingering. The question is frequently raised in such cases, Why should the patient knowingly submit herself to the inconvenience and pain necessitated by the self-production of such necrosing lesions. In cases occurring in the malingerer of any sort the reason is obvious. To account fully for the disease in the case of the truly hysterical woman, or in a neurasthenic man, is as difficult as it is to explain their disordered state of mind.

The lesions, in all their varying degrees of severity, frequently at different stages at one time, may be produced on any part of the body, often, however, on the extremities or on parts easily reached by the hands. The lesions are irregular in their distribution, and do not conform to any definite nervous or vascular areas. On the other hand, some would-be sufferers with a more highly developed artistic sense make valiant efforts to simulate the appearance or distribution of diseases which they may have seen or of which they may have read; and thus it comes about that the physician first brought in contact with such a case sees resemblances to the necrotic types of herpes, or attempts to define the segmental areas of the body by the distribution of the artificially produced sores. The severity of the disorder may be most severe, and its duration is occasionally measured by years. The process of healing is prolonged, partly, no doubt, on account of the materials selected for the production of the lesions and their continuous though furtive employment, partly because the flexures and other surfaces where healing is difficult may be the sites of the injury, and partly on account of the depressed condition of general health frequently presented by the patients. As a consequence, such conditions as Raynaud's disease, dermatitis herpetiformis, necrosing herpes zoster, pemphigus, and, in prolonged cases, some forms of sclerodermia may be simulated.

The materials used by the patients vary according to the ease with which they may be obtained, and according to the patient's knowledge of their effects. Usually the acids and alkalis are employed. Solutions containing vinegar and acetic acid, the stronger acids, such as hydrochloric, sulphuric, and carbolic, various acid salts, caustic potash and soda and their solutions, many of the caustic salts of the alkalis, have been found to be the materials used, and this list may be considerably extended. The slow and painful healing of some of the lesions, as, for instance, those on the backs of the fingers and hands simulating the ulcerations following on *x*-ray destruction of the skin may be due partly to the materials used.

There remains a small residuum of cases of this type of gangrene, reported by physicians of the highest competence, who have declared that the factitious origin of the disease, in their opinion, was impossible, and that it results from some definite nervous or vascular lesion. Though, in deference to these observers, the possibility of a true spontaneous gangrene not induced by the patient may be left as an open question,

it can be stated that the more these cases are investigated the less probable does this explanation become. The intervention of the patient is often most difficult to determine, and in reported cases has taken months, or it may be years, of observation to disclose. Cases are on record in which even the amputation of the apparently offending member has not produced a sufficiently definite effect on the nervous system to prevent the patient continuing the irritation producing the eruption on other parts of the body, and yet, after all, the patient has admitted that the whole condition was produced by himself. A recent case occurring in an unmarried woman occupying a responsible position, with excellent prospects of advancement, was not checked even when a surgeon in good faith, not appreciating the disorder, proposed amputation of the affected hand. In this case, as frequently happens, the occurrence of an accidental injury, namely, a whitlow, seems to have suggested the subsequent developments. It should be mentioned, as a note of warning, before a definite diagnosis is made of an artificially induced eruption of this nature, that every effort should be made to discover its method of production before suspicion is raised. When the diagnosis is suggested the doctor will probably find that the sympathies of the patient's friends are arrayed against him in her defence, and not only the friends, but even medical colleagues in attendance on the case may regard the diagnosis as entirely improbable, and further investigation is therefore rendered difficult. It should especially be borne in mind that certain forms of peripheral ulceration and necrosis occur in syringomyelia, and that easily induced infective conditions preceding gangrene occur in other diseases of the central and peripheral nervous systems. These must be carefully excluded from the category of spontaneous gangrene of the skin.

It must be concluded that any patient, male or female, shewing this peculiar form of skin affection falls under the strong suspicion of producing the disease by artificial means, and that, except in so far as it may be simulated as the result of certain grave and easily recognisable diseases of the nervous system, spontaneous gangrene of the skin of this type is unknown.

The *treatment* of this disease consists in the observance of two main conditions: first, the improvement of the patient's nervous health, and the removal of the temptations which lead to the production of these injuries; this, in turn, consists in the application of the principles underlying the treatment of all neurasthenic patients: second, the employment of local remedies for the healing of infected wounds. It is worthy of note that the excoriations and ulcers characteristic of the disease are frequently slow to heal; this is explained by the positions in which they occur, the materials used for their production, and in some cases by the desire of the patient to prevent healing. The use of permanent applications and dressings to the affected surfaces, such as by bandages or dressings, secured so that they may be removed only by the medical attendant himself, is often an effective way

of preventing the eruption and obtaining good healing, but in most cases the ingenuity of the medical attendant will be continually exercised, not only in the general treatment of his patient, but to obtain good healing of the local lesions (*vide* also p. 91).

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**Bedsore.**—This name is applied to the form of gangrene resulting from injury produced by constant or even intermitting pressure on the skin usually in a state of imperfect nutrition the result of acute or chronic disease. In healthy persons, if pressure be maintained on an area of skin for a sufficient length of time, the cells, deprived of their source of nutrition by obstruction to the blood supply, will degenerate. When the blood returns to the part it is no longer properly retained within the blood-vessels; these are first distended, producing a dark erythematous flush on the surface, and, if the injury has been sufficiently severe, the blood itself escapes from the vessels, infiltrating the surrounding tissues at first with serum, and finally with the blood-cells. Extensive necrosis of an area affected in this way almost necessarily results. In cases of more prolonged pressure the blood never returns to the part pressed upon, which remains anaemic and forms a greyish or brownish dry slough which finally separates, leaving an ulcer of varying depth and extent. In both cases the process of necrosis from mechanical pressure is complicated by the invasion of bacteria, and suppuration with extension of ulceration is prone to result. Pressure of this character will result from lying in the same position for a sufficient length of time. In the case of those debilitated from any cause, there is a special likelihood of undue pressure being exerted on the points where the body rests. The pressure from splints, bandages, and other applications, or even the weight of the bed covering is sufficient to produce this result. The severity of the process is much increased in the case of helpless patients unable to protect themselves by change of position or proper cleanliness. The soiling of the body by the excreta is the most efficient cause of the extension and aggravation of the sores originally produced by decubitus. Its effects are even at the present time only too commonly seen in the case of helpless persons and those suffering from acute illness who have the misfortune to be badly tended. The usual sites of bedsores are therefore those parts liable to be exposed to pressure, such as the regions of the upper part of the sacrum, of the lower vertebrae, the bony prominences of the trochanters, the skin over the malleoli, the heels, the

front of the knees, the elbows, and similar situations. The destruction of tissues may be most extensive. The deep fasciae, the muscles, and tendons may slough, and the underlying bone may be exposed. The bone itself may shew necrotic changes and ulcerate. If pyogenetic infection of such an area becomes severe or virulent, "spreading gangrene," septicaemia, and pyaemia are natural consequences.

At the present day the severe bedsore is comparatively rare in hospital practice. To the student it is little known, and its perils are often not appreciated, but it must be remembered that not long ago it was common to see a patient with an ordinary fracture of the leg or thigh presenting a bedsore; that it was considered almost impossible to prevent "sores" in a case of prolonged illness, and that if the illness were due to disease or injury of the spinal cord or of the central nervous system, with incontinence of urine or faeces, the appearance of bedsores was regarded as a matter of course. A very short experience of hospital work even at the present day will give evidence of the ease with which bedsores may develop in patients who may have been ill for only a short time before admission, and will warn the student of the experiences in store for him when in charge of sufferers from prolonged illness, who have not the advantage of careful attention and skilled nursing. The comparative infrequence of bedsores at the present day is due to the appreciation of the conditions producing them. One of the main endeavours of a careful nurse is to prevent these causes from becoming effective. Even in the most difficult cases of disease of the spine and central nervous system, the inevitable consequence of bedsore should not for a moment be admitted. It may truly be said that a nurse's skill can be estimated by the infrequency and slightness of bedsores occurring in cases of prolonged illness under her or his charge. A well-trained and conscientious nurse feels the disgrace of bedsores, and will watch with the greatest satisfaction the gradual healing and cicatrisation of the sores of a neglected case when properly treated. In cases of certain destructive lesions, especially of the spinal cord, it must be admitted that the occurrence of acute bedsores, even in the best circumstances is almost impossible to prevent. The skin over the sacrum, trochanters, and other areas of pressure becomes congested, and sloughs make their appearance with alarming rapidity. When the trophic influences of the central nervous system are interfered with by such lesions, the difficulties in preventing bedsores are no doubt greatest, but it should be recollected that even in such cases the factor of pyogenetic infection remains the most perilous to the patient, and that this source of danger is to a large extent under the control of the nurse.

*Treatment.*—The preventive treatment of bedsores is by far the most important, and the responsibility of this rests on the attendant or nurse of the patient. Every precaution should be taken to prevent continuous pressure on any one part of the skin. If the patient retains the power of voluntary movement, even slight contraction of the muscles, without changing the position of the body, helps the circulation in the skin

greatly. If possible the patient should be encouraged and assisted to change his position from time to time. Anything that presses on the skin—bandages, dressings, clothing—must be watched, frequently changed, or removed entirely. As occasion serves, other aids to treatment such as the use of water beds or pillows and felt cushions, should be called into requisition to distribute the pressure of the body weight over as large an area as possible. The care of the skin itself demands the utmost attention; absolute cleanliness must be maintained. After the necessary ablutions are carefully performed, the skin must be made perfectly dry; moisture from washing, sweat, urine, or any other cause left on the skin will tend to macerate the horny epidermis and to promote bedsores. After drying the skin, the use of a dusting powder of siliceous earth and zinc oxide, if necessary mixed with proportions of a non-irritating antiseptic such as boric acid, is advisable. The use of powdered rice, starch, and other organic materials in such dusting powders has many objections, and should be avoided. It is often recommended to rub the skin gently with alcohol so as to "harden" the surface. This procedure may be of service in the case of persons confined to bed from injury, though otherwise in good health, and the antiseptic effect of the alcohol may also be beneficial, but in all cases of disease, or when the skin is already oedematous or discoloured, the less rubbing of the surface the better. The best treatment for the unbroken surface is cleanliness and dryness. When the skin becomes discoloured in the slightest degree, all pressure on that area should, if possible, be removed and distributed elsewhere, while the prevention of soiling of the discoloured surface becomes a matter of the utmost solicitude. It is only after the surface has unfortunately become broken that antiseptics should be used. At first mild applications of boric acid, or some other appropriate antiseptic, in the form of pastes or powders, to protect the surface should be employed, but in cases of old and neglected sores with much slough or tendency to suppuration, strenuous efforts to render the wound aseptic are necessary. Then such materials as perchloride of mercury, salicylic acid, carbolic acid, peroxide of hydrogen, in the form of local applications, fomentations, and lotions have their place and will prove of service. A preparation which has long enjoyed a high reputation in the treatment of the sloughing ulcer from bedsore is gum benzoin—friar's balsam. This drug may be used in the form of the tinctura benzoini composita, and is useful both from its deodorant and from its antiseptic properties. The removal of the sloughs, the opening of abscesses, and the control of suppuration will be necessary to reduce the infective influences. The general principles of the treatment of infective wounds must necessarily be carried out. In spite of precautions the ulcers, as a rule, heal very slowly, and leave extensive and disfiguring scars.

**Effects of Cold.—Chilblain** (SYN.: *Erythema pernio*), and certain related conditions.

*Description.*—This very common affection may be considered as a chronic form of erythema, closely allied to the angioneuroses of the skin. Its most severe manifestations are seen in persons who possess a peculiar form of enfeebled or stagnating circulation in the extremities. The lesions are usually produced by exposure of the parts to cold or during a fall of atmospheric temperature.

The disease most frequently affects the young of both sexes, especially during the winter, the eruption vanishing as warm weather arrives. It is noteworthy that with increase of years the tendency to the occurrence of chilblains diminishes, yet some persons remain liable to chilblains all their lives, often to a very extreme degree. Those individuals who are specially subject to chilblains, after passing the period of childhood usually shew other easily observed abnormalities. Many of these persons are recognised by their relatives as having "delicate" health. They may suffer from a tendency to enlargement of the lymphatic glands from very slight causes. The blood circulates through the extremities slowly, the cutaneous capillaries tend to become readily dilated, and remain dilated for long periods, giving a purplish or even cyanosed aspect to the hands, feet, nose, cheeks, and ears—the more markedly affected parts. The same tendency in these persons to localised congestion produces circinate and blotchy erythematous patches on other parts of the body. A similar condition is frequently observed as the result of exposure to heat, producing as a result "ephelides ab igne." The rate of the heart in such persons not infrequently varies from the normal; in the majority of cases probably the frequency of the pulse is about normal, but it is not uncommon in such persons to find a pulse-rate normally between 40 and 50 in the minute, and occasionally even less frequent.

There are other patients presenting the characteristics of cutaneous capillary dilatation with a stagnatory peripheral circulation in whom the pulse-rate is increased in frequency. In one such case under my observation the pulse-rate for years varied between 100 and 200; the balance of the circulation was easily upset, the pulse frequency increasing from a little over 100 to 180 almost immediately, and remaining at the higher level for hours at a time. Such patients shew a permanent though varying dilatation of the cutaneous capillaries over the whole body. They are not only exceedingly liable to chilblains, but to many other cutaneous ailments due either to the congestion of the skin or the insufficient resistance of their tissues. With this feebleness of the peripheral circulation there is usually a tendency to hyperidrosis, the hands and feet especially being unnaturally clammy and moist.

Certain other individuals, who suffer severely from chilblains during adult life, with more or less of the circulatory disturbance mentioned, tend to develop changes in the joints resembling those of osteo-arthritis. In addition to the pains and stiffness of the joints they frequently suffer from dyspeptic disturbances, and are often considered to be of the gouty diathesis, though with little real evidence of this condition.

In addition to those individuals who are peculiarly prone to the

appearance of chilblains on slight exposure to cold, many persons of robust habit find that they develop chilblains, it may be for the first time in their lives, on taking up their residence in a colder climate than that to which they have previously been accustomed. In our climate, winter residence on clay soils, with the additional disadvantage of insufficiently warmed or damp houses, is very prone to develop the chilblain tendency in otherwise healthy individuals.

The parts of the body most liable to chilblains are those subject to exposure, especially the extremities. Thus, the fingers, the toes, the hands, and feet are perhaps the most common situations; the ears are frequently affected, and it is not uncommon to find a chilblain on the point of the nose.

The *anatomical lesions* occurring in this condition are first of all contraction of the small vessels and capillaries owing to the stimulation produced by cold. The result is pallor of the affected area, and the condition when it affects the hands is well known under the name of "dead fingers" (*vide* Vol. VII. p. 121). Provided the vasomotor mechanism is not destroyed, the reaction from this condition of pallor is characterised by erythema, sometimes of great intensity, of the affected area. If the vasomotor paralysis is sufficiently severe, the cutaneous capillaries and vessels remain distended and do not contract after their engorgement. The result is that serum, which may be blood-stained in severe cases, escapes from the vessels, and the cutis and epidermis become oedematous. Swelling of the affected area results, the sodden tissues are very easily injured, and the epithelium becomes very readily removed. It is rare to see the epithelium clearly raised from the surface as a bulla, but very slight friction is sufficient to remove it, when a broken or ulcerated chilblain is the result. The ulcers so formed are difficult to heal, and if pyogenetic inoculation take place considerable loss of tissue with the subsequent formation of a scar may result from the extension of the ulcerative process. As the weather becomes milder, the circulation of the extremities is more readily controlled, the vessels recover their "tone," serum is no longer exuded, the oedema drains away along the lymphatic vessels of the part, which gradually becomes restored to something like its normal conditions. It is not unusual, however, in severe cases to find that scars are left as the result of ulceration, and usually the tissues in the neighbourhood of the finger-joints remain thickened, whilst in other cases, the articular extremities of the phalanges seem to undergo enlargement.

It will be observed how clearly the history and the lesions of chilblains bring the disease into relationship with other angioneurotic conditions, and with true lupus erythematosus on the one hand, and with erythema induratum on the other. The peculiar lesions which have been much discussed under such names as "folliclis," "acneiform" and "necrotic tuberculides," and which bear a close resemblance to erythema induratum in many cases, may be readily compared to necrosing chilblains, the process of necrosis depending upon the

intensity of the vascular lesion, and such accidents as thrombosis, or the occurrence of leucocytic infiltration resulting from accidental pyogenetic infection.

The *signs and symptoms* of chilblain are well known. The affected parts vary from a dusky red to a deep purple colour and present a varying amount of oedema. A small rounded area on the back or edge of a finger or toe may be the only affected spot; but in other cases the whole hand may be discoloured with large confluent lesions. The chilblain is accompanied by sensations of heat, itching, and pricking, which may be so severe as to cause the patient to rub and scratch the part vigorously in spite of the obvious damage caused. There is little disturbance of health, unless unusually severe pyogenetic infection occurs. The disease is generally more uncomfortable and disturbing to the patient's temper than dangerous.

Exposure to severe degrees of cold below the freezing-point gives rise to well-known destructive effects on the tissues. Usually these are classified in three degrees; first, contraction of the blood-vessels, followed by congestion, and usually intense lividity, a stage which closely resembles the condition of chilblain, but, as noted above, the etiology of the condition is not the same. The second degree is characterised after recovery from the frozen state by oedema, vesication and production of bullae, and more or less superficial destruction, the result of ulceration. As the consequence of exposure to greater degrees of cold, or for longer periods, no attempt at recovery can be made, and the third degree, namely that of gangrene of the part results. The first stage of cold-trauma, characterised by temporary paralysis of the vasomotor mechanism only, has under favourable conditions a natural tendency to recovery, but, when the two further degrees are reached, loss of tissue, more or less serious in amount, is sure to follow.

*Treatment.*—Preventive treatment is by far the most effectual, both in the case of chilblains and in the somewhat analogous injuries directly resulting from cold.

Chilblains.—In young persons, and in those liable to be affected by chilblains, every means should be adopted to aid the tissues to withstand the strain put upon them by the lowering of temperature. The extremities should be warmly clothed, but the wearing of tightly-fitting boots and gloves carefully avoided. Exercise should be encouraged in order to stimulate the circulation, and to keep the tissues of the extremities in as well nourished a condition as possible. The general health should be well guarded and depressing conditions avoided, especially in the case of persons with feeble circulation. The use of local massage or of gymnastic exercises is often of much service. Care should be taken to keep the hands and feet as dry as is possible. The perspiration, which is often profuse, should be frequently removed; warm water must be used to wash the hands and feet, the utmost care being taken to leave the skin perfectly dry. The application of a mild antiseptic dusting powder is of service, such as the finest powdered siliceous earth, 50 per cent,

zinc oxide 25 per cent, boric acid 25 per cent. The addition of a small amount of camphor or of menthol to such a dusting powder is often grateful to the patient.

During the first stage of chilblain, while the blood-vessels are contracted, slight stimulation of the surface may be used, or the hands gradually warmed. It is in this stage that the stimulant applications at one time so much in vogue in the treatment of chilblain are of some service. These applications contain solutions of volatile oils, iodine, and other counter-irritants, with the intention of producing hyperaemia in the affected regions, but it is needless to say that such applications should be used with much care.

When the second stage, that of venous engorgement, has arrived, the main indications are to preserve an equable temperature in the affected part, and to await the recovery of the vascular tone. Gentle pressure by bandaging when practicable is often of service. To prevent the itching which is often so troublesome, the use of the dusting powder already mentioned with menthol is useful. Cooling lotions, such as weak solutions of the liquor plumbi subacetatis in alcohol are often grateful, but moist or oily preparations should be used with caution, so as not to macerate the already fragile epidermis. The parts should still be kept dry and free from sweat. If, in spite of our efforts, ulceration occurs, the sores must be treated on general principles of cleanliness, salves or paste dressings containing antiseptics such as salicylic acid, carbolic acid, resorcin, menthol, camphor are of service, a useful formula being the following: — Resorcin 2 parts, menthol 3 parts, soft white paraffin to 100 parts.

Electricity in various forms has been much used in the treatment of chilblains, but with comparatively little good result. The application of currents of high frequency in some cases seems to relieve, at any rate temporarily, the feeling of discomfort and intense irritation which is so marked a feature of this troublesome malady.

Lupus pernio or chilblain lupus, *vide* p. 502.

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**Effects of Heat.**—The lesions of the skin produced by heat require a much more complete explanation than that previously held to be sufficient. As the result of much recent investigation it has been found necessary to distinguish the effects of mere rise of temperature from those produced

by the rays of light, and from the radiations known as the ultra-violet and chemical rays of the spectrum. The simple elevation of the temperature, as by the exposure of the tissues to the action of the cautery, results in an unselective destruction of the tissues, depending on the degree to which the temperature is raised, the extent of the area exposed, and the duration of exposure. The effect, as is well known, is to produce complete necrosis, followed by sloughing of the affected tissues. On the other hand, many of the forms of inflammation of the skin which have till recently been attributed to the heat of the sun's rays are doubtless caused not so much by increase of temperature as by the ultra-violet and chemical radiations. These radiations are peculiar in this respect that they have a selective power, certain cells and tissues being more easily affected by them than are others. In the case of most living protoplasm their effect when prolonged is no doubt destructive. But in the first instance, or in mild degree, they may stimulate and thus be of advantage to the organism. Certain diseases of the skin, varying in severity from freckle and common sunburn (erythema solare) through varieties of long lasting erythema, such as certain types of the disease known as lupus erythematosus, and the destructive inflammation to which the name of hydroa aestivale has been given, to the extremely dangerous and even fatal affections grouped under the name of xerodermia pigmentosa, are now capable of much more intelligible explanation than was previously possible. There is now little doubt that this important group of maladies expresses the reaction of the tissues to atmospheric radiations which are not merely heat. In the same category of cutaneous injuries may be grouped those produced by the electric current, the effects of electric light, especially the only too well-known injuries produced by the *x*-rays of Röntgen and the emanations of radium. The discrimination of the different results on living tissues produced by the various radiations of the spectrum has been greatly extended by the researches of the late Niels Finsen, of Copenhagen, and by many others following in his footsteps. Much evidence has gradually accumulated, fully shewing the destructive effects of the violet rays, the comparatively soothing effects of the red rays on living cells, and the peculiar injuries and good effects resulting from the *x*-rays and from radium; a large field of scientific investigation is now under exploration, and much good has already resulted from the adaptation of the properties of these various radiations to the treatment of certain diseases of the skin and internal organs. The powerful effects of these agents has been amply shewn, not only in the case of the diseased tissues exposed to their action, but unfortunately by the severe accidental injuries received by many investigators who first ventured into this newly discovered region.

One of the most simple of the changes of the skin produced by the action of heat is that to which the name *ephelis ab igne* has been given. This eruption occurs usually on the lower extremities of elderly persons who are in the habit of sitting in front of the fire for warmth. It is produced by repeated congestion of the capillaries of the skin, the venules

become paralysed and permanently distended, allowing of the escape of blood-cells and the deposit of blood colouring-matter in the cutis. There remain circinate patches and lines of pigment of the cutis, corresponding to the vascular areas of the skin. This peculiar pigmentation, which gives rise to the name of the condition, remains permanently, although, unless the erythema be renewed, it tends to fade. The eruption most commonly occurs in the old, but occasionally it is seen in the young without a history of exposure of the lower extremities to high temperature. No doubt other causes of chronic venous engorgement, including exposure to cold, are capable of producing a similar result (Juan de Azua and Sala y Pons).

Higher temperatures, or long applications of comparatively low temperatures, produce burns in their various degrees. These are now generally described as three. The first or erythematous, the second or vesicant, and the third or escharotic extending to the cutis vera and deeper tissues. It is well to remember that the characteristic lesion of the burn is destruction of tissue, and, although a scar need not result in the first degree, nor even in the second, destruction of tissue has taken place. In this way a burn can be distinguished from lesions of angio-neurotic origin, which may closely simulate the mild degrees of burning. The more severe degrees of burning are of interest to the dermatologist, not only on account of the extremely severe local injury which results, but also on account of the serious constitutional effects produced by the destruction and loss of large areas of epithelium. The shock following these cutaneous lesions is most serious, and it is not infrequent to find coma supervening with a low body-temperature before the fatal result. Occasionally restlessness and delirium are observed. Remarkable alterations in the composition of the blood are noted, consisting in the destruction of the red blood-corpuscles and alterations in the character and number of the leucocytes. The secreting cells of such organs as the liver and the kidney are also affected by degenerative changes, preceding the total loss of their function. Many investigators have sought and found abnormal substances of toxic character in the blood and tissues. The type of toxaemia which results closely resembles those associated with what are now described as the acid intoxications seen in various forms of chemical poisoning, such as in diabetes and delayed chloroform poisoning. The peculiar congestions and ulcerations of the stomach, duodenum, and intestinal tract are well-recognised results in the severest forms of burn poisoning. Many complications, the result of infective changes affecting the exposed surfaces, may occur, such as suppuration, erysipelas, pyaemia.

Many of the eruptions indicated in the preceding paragraphs, in the causation of which the ultra-violet and chemical rays of the spectrum are more concerned than the rays of light and heat, are described in other sections of this work. It may be of some importance to suggest that in certain of these conditions, such as erythema solare, ephelides, general increase of pigment, and the early stages of xerodermia pigmentosa, the

formation of the colouring material and its disposition in the skin should be considered as an attempt to protect the living cells of the body from the irritant action of the more destructive radiations. The colouring matter acts by the intervention of a pigmented screen—a process which has come about more perfectly in the dark races inhabiting regions where the sun's rays are stronger than in temperate climates. It is interesting to note that the experiments of Finsen shewed that the colouring matter of the blood itself protected the living tissue against the action of destructive rays.

*Treatment.*—It is of the greatest importance to recognise the value of general measures in the treatment of severe burns. Precautions must be taken to prevent the loss of the body heat, to secure rest for the patient, and to use every means to promote the nutrition of the sufferer. The judicious use of alcohol in the early stages of exhaustion and shock is often of service, and opium and its alkaloids will be of much value in obtaining rest and dulling the sense of pain. Locally, burns of the first degree should be treated with cooling applications, such as weak solutions of the subacetate of lead combined with small quantities of alcohol. These form the well-known evaporating lotions, and their use is of much service in diminishing pain and the feeling of heat and irritation. The free use of dusting powders is also of service in soothing the injured surfaces. The dusting powders used should as a rule be free of starch or other organic materials. They are best prepared from such materials as zinc oxide, the siliceous earths in fine powder, and such preparations as powdered talc and cimolite. These may be combined in various proportions; boric acid in fine powder may often be added to such dusting powders with advantage. One of the most valued remedies is made by the combination of lime water and oil in the form of the well-known Carron oil. Dressings made from these materials have long been held in high repute. Linseed oil, olive oil, almond oil, are all of service, and may be combined with the liquor calcis in various proportions. The linimentum calcis of the Pharmacopoeia is made by mixing equal parts of the solution of lime and of olive oil. In some cases it is advisable to use larger quantities of the oil.

In burns of the second degree the most careful precautions as to cleanliness should be taken to prevent the infective complications, which may be very serious. The blisters should be carefully drained when they are so large as to threaten spontaneous rupture, or when they interfere with movement or become inconvenient. The covering epithelium should be left in place when possible. Although antiseptics are nearly always necessary, care should be taken to provide against the absorption of such drugs as salicylic acid, carbolic acid, or mercury. Severe cases of poisoning by these antiseptic drugs have occurred, resulting from their being used too freely as dressings on burnt surfaces. It is for this reason that boric acid is an antiseptic of so great service in the treatment of burns. The use of picric acid has been strongly recommended as a dressing for bare or granulating surfaces. Weak aqueous solutions of about 1 per

cent are usually used as compresses or as applications to extensive surfaces. This drug has a toxic action, as have most other antiseptics, and it must be used carefully.

In the third degree the means already indicated should be carried out with even greater watchfulness and care. The use of general baths, the patient being allowed to remain in them for long periods, is a form of treatment which has been frequently recommended as the result of Hebra's example. In severe burns of the third degree the general treatment of the patient in order to support his strength and nutrition becomes of overshadowing importance. The granulating surfaces left by burns are frequently slow to heal, and skin-grafting or transplantation may be of much service. But with the greatest care and cleanliness the formation of cheloids, of thickened hypertrophied scars, and of subsequent deformities, and contractions involving joints, cannot be avoided.

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**Dermatitis Gangrenosa Infantum** (Crocker); **Varicella Gangrenosa** (Hutchinson); *Ecthyma gangrenosum; Ecthyma térébrant.*—This somewhat rare affection occurs in children, and is no doubt the result of the infection of lesions, arising from numerous causes, by virulent pathogenetic micro-organisms. The early cases described by Sir J. Hutchinson followed chicken-pox, and perhaps the majority of cases occur as sequels of this disease; but, as many cases have been noted after vaccinia, hydroa, miliaria, and other vesicating erythematous eruptions, the name given to the disease by Crocker is more inclusive than Hutchinson's earlier designation.

*Etiology.*—The conditions required for the development of the malady are probably the comparative feebleness of resistance of an infant or a child debilitated by previous disease, the presence of the cutaneous lesions of one of the infective fevers or some other cutaneous eruption, and finally the implantation of a virulent strain of pathogenetic micro-organism. No doubt many pathogenetic micro-organisms are capable of producing this affection. The character of the lesion, its tendency to spread, and the mode of destruction of tissue suggest the action of the *Streptococcus pyogenes*, which has often been found to be present. The pus-forming staphylococci, which are usually present, are capable of producing very similar lesions, especially when they are in a virulent state. Ehlers and other observers have shewn that the *Bacillus pyocyaneus* is present in cases of ecthyma térébrant, whilst in other outbursts organisms resembling the *Bacillus diphtheriae* have been observed. Cases of localised necrosis of the skin, which seem to present the same etiological features, occur not infrequently about the lower part of the body, the upper

part of the thighs, buttocks, and genitals of infants. In these cases, want of proper care and cleanliness, fouling and infection by napkins, have an important influence in their production.

*Clinical Picture.*—The character of the onset varies with the nature of the primary affection. In the cases following chicken-pox the gangrenous lesions of the disease shew themselves before the eruption has subsided; while the varicella crust is still present ulceration occurs below it, an inflammatory areola is observed to spread round the lesion, and in the course of a few hours, or a day or two, the spot of varicella has transformed itself into a black slough which may be an inch and a half

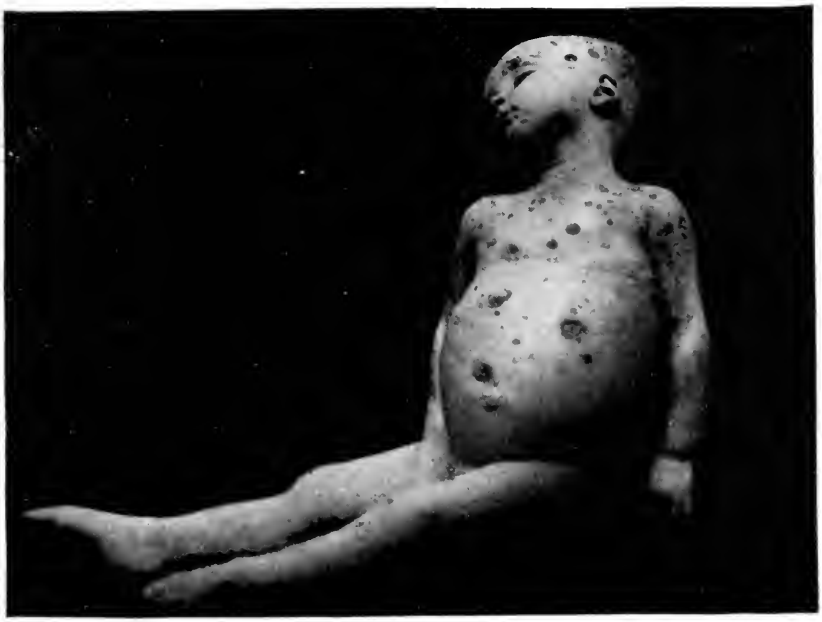

FIG. 6.—Dermatitis gangrenosa infantum, following chicken-pox.

in diameter, and may extend deeply through the epidermis and cutis down to the subcutaneous tissue. Usually, on reaching a certain size, the slough separates and leaves a punched-out oval or rounded ulcer, with abrupt edges, and with necrotic tissue or unhealthy granulations forming its floor. In many cases, the ulcer thus formed does not spread further, and rapidly shews a tendency to heal. In other cases, however, deep suppuration may ensue, the ulcers develop a tendency to peripheral extension, and a condition of the utmost gravity results. In the case of a child under my observation suffering from the disease in its characteristic form, consequent on an attack of chicken-pox, a large abscess was formed under the occipito-frontalis aponeurosis; this abscess resulted from perforation of the aponeurosis by one of the lesions, so that pus

collected between the aponeurosis and the cranium. In such severe cases, all the consequences of severe infection may result, including general septicaemia and the occurrence of pyaemia. From cases of such severity all degrees may be seen, to mild attacks presenting 1 or 2 gangrenous lesions only, with a few superficial pustules on other parts. These may not advance further and may heal rapidly with a little scarring, or they may be but the first stage of the more serious type of affection. When the disease is engrafted on the lesions of chicken-pox, for example, it does not confine itself to the primary spots of eruption, but numerous fresh foci are established as the result of local infection, which may remain isolated or, becoming confluent, form the larger ulcers with circinate margins. In this way the patient may be studded over from head to foot with gangrenous lesions of various shapes and sizes.

The constitutional disturbance is, as a rule, very great. The pyrexia is excessive, and pyaemic complications are usual. In the case already referred to symptoms of general pyaemia developed, and numerous bronchopneumonic lesions and suppurating foci in other organs were found after death. Even in cases in which, at the onset, the eruption seems comparatively slight, and the infant not seriously affected, the prognosis is always doubtful. The severer type of lesion is apt to develop with its grave consequences. Experience shews that this seems to be especially true in the case of what appears at first sight to be the milder type of the disease developing in the "napkin region" of infants.

The children who suffer from the disease are usually enfeebled by previous illness, by want of proper food, and other forms of neglect, and very often exhibit the lesions of rickets or tuberculosis. Occasionally, however, it appears in well-cared-for children. In such cases the attack may at first appear to be slight, but is apt to deceive both the doctor and the parents by the sudden development of grave symptoms. The majority of the cases occur in the marasmic children so frequently seen in the out-patient department of city hospitals or dispensaries.

The *prognosis* is naturally very serious, and varies with the extent of the lesions, the character of the infection, and the presence or absence of other diseases such as tuberculosis.

The *treatment* of this malady consists chiefly in rendering the diseased areas of skin free from infection as quickly as possible. All pent-up pus should be evacuated immediately. In the case of the child already mentioned, after the abscess of the scalp had been opened and cleansed, marked improvement was noticeable, and it was not for some days that the fatal pyaemic complications supervened, probably from other sources. When the lesions are numerous, boric acid is one of the most suitable antiseptics, and may be applied in soft paraffin, or dusted as a powder over the lesions. The quickest and most satisfactory way of cleansing the surface is to place the child in a boric-acid bath, in which crusts and discharge may be washed away, the lesions being subsequently dressed in the manner already indicated. The temptation will arise to apply the stronger antiseptic remedies to the actual necrosing ulcers

with the intention of destroying the pyogenetic micro-organisms. When the lesions are numerous, as is usually the case, this method is impracticable, and even when they are few in number it is doubtful whether, in the case of the infants usually the subjects of the disease, more harm than good may not follow this method of treatment. The utmost efforts should be made at the same time to improve the general nutrition of the patient by appropriate food and general hygienic precautions. If the child survive the poisoning of the early infection during the period of development of the first lesions, recovery may be hoped for.

The ulcerated surfaces remaining must be treated by the usual antiseptic methods and applications, and as convalescence is established it is remarkable how quickly they heal. Permanent scarring is certain to remain.

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**Necroses and Degenerations of the Skin depending on Vascular Changes. Necrosis of Extremities.**—1. *Senile Gangrene.*—The form of gangrene usually described under this name may be considered at first sight to be the most easily explained of the varieties of necrosis, as it is admitted to be the result of failure in the supply of blood to the extremities due to obstructive changes occurring in the arteries supplying the parts. The reason of this obstruction is the presence of degenerative changes affecting the coats of the blood-vessels in the old persons who suffer from this form of gangrene. The symptoms preceding the appearance of the gangrene may last for years and include disturbances of sensation such as numbness, tingling and pain in the affected part, and the peculiar results of a temporarily obstructed circulation described under the names of angina cruris, and intermittent claudication. Vascular disturbances, more or less permanent in character, also occur, such as pallor due to deficiency in the arterial supply, and congestion due either to permanent dilatation of the capillaries and venules or to blocking of the veins carrying the returning blood. The appearance of black areas, usually near the tips of one or more toes and less commonly on the fingers, indicates the total failure of nutrition. The black areas increase in size till the whole of the affected digits, the adjacent part of the foot, or hand, and even more extensive areas, may become gangrenous. Usually the gangrene is of the dry variety, but moist gangrene is apt to appear, usually at the proximal extremities of the dry area, as the result of pyogenetic infections. The characteristic features of senile gangrene are then present.

Many cases of gangrene of this form in old persons are complicated by the presence of other morbid conditions, such as glycosuria—conditions which are recognised as producing, or being associated with, disease

of the blood-vessels. The question is thus raised whether or not there is any advantage in considering cases of senile gangrene to be distinct from gangrene of the extremities occurring in younger persons, in whom it is possible to explain with more certainty the origin of the underlying vascular disease. This in turn leads to the question whether it is reasonable to regard the arterial changes in so-called simple senile atheroma as of the nature of a pure degeneration, or whether, even in apparently uncomplicated senile cases, the vascular obstruction may be due to some unrecognised bacterial or other infective process.

2. *Necrosis of the Extremities occurring in Youth and Middle Age.*—This large group includes cases of gangrene arising from many different causes. A satisfactory classification is not yet possible, though much information has been obtained concerning their etiology as a result of the recent study of the diseases of blood-vessels.

Raynaud's Disease.—The phenomena described by Maurice Raynaud in 1862 were so striking and made so great an impression that the majority of cases of necrosis of the extremities occurring in early life or in adult age were included in his category. Paraesthesia of the affected parts associated with, or followed by, the classical triad of symptoms, namely, local syncope, local asphyxia, and symmetrical gangrene, occurs more or less noticeably in all forms of terminal necrosis; and although considerable variations of symptoms were observed to occur in cases of Raynaud's disease, this title was considered sufficiently comprehensive to include most, if not all, of them.

Now, however, it is desirable to make a more discriminating application of the name Raynaud's disease, and to include under this title such cases only in which no disease of the arteries, veins, or nervous system can be discovered; the presumption being that the contraction and dilatation of the blood-vessels, which bring as a consequence the phenomena described by Raynaud, is of functional nature only, so that the vessels recover their normal characters and functions in favourable circumstances or during the remissions of the attacks. A feature of great importance in Raynaud's disease is that symptoms referable to the internal organs are occasionally observed, in all probability produced by changes in the blood-vessels similar to those of which we have evidence in the characteristic attacks affecting the feet and hands, the lips, ears, and cheeks. Thus the subjects of Raynaud's disease occasionally suffer from abdominal pains resembling colic; temporary alterations in the fundus oculi occur, producing amblyopia, almost certainly resulting from evanescent vascular changes; the central and peripheral nervous system may be affected, resulting in various forms of temporary paralysis. A case has recently been under my observation of a young woman with well-marked Raynaud's phenomena, affecting the hands and feet, in whom there occurred temporary paralysis of both lower extremities and loss of control of the sphincters, followed by gradual and complete recovery of power and movement. Increase of the deep reflexes remained long after power was regained.

It has long been recognised that some cases of Raynaud's disease are associated with haemoglobinuria, discoloration of the skin resembling jaundice, and enlargement of the spleen, indicating serious changes, also of temporary character, in the blood-forming and blood-destroying organs.

For the present it is assumed that no organic disease affects the blood-vessels in cases of Raynaud's disease, but though no change may be discovered it is impossible to defend the statement that none exists, especially when the insidious and widespread effects upon the blood-vessels and other tissues produced by such conditions as congenital syphilis are being gradually discovered (*vide* also art. "Raynaud's Disease," Vol. VII. p. 120).

*Erythromelalgia.*—This term was applied by Weir Mitchell in 1878 to cases which he had previously described, "in which a part or parts of the body—usually one or more extremities—suffer with pain, flushing, and local fever, made far worse if the parts hang down." Such cases not infrequently terminate in gangrene of the extremities, often of wide extent. The most striking feature of this disease is the burning pain, sometimes of great intensity, associated with swelling and redness. The disease is liable to exacerbations, during which the symptoms, especially that of pain, are greatly increased, but during the intervals the affected part rarely returns to its normal condition, being always reddened, or swollen, or painful, especially when hanging down. It differs thus from true Raynaud's disease, in which the affected part, at any rate in the early stages, returns to the normal condition between the attacks. By far the greater number of cases of erythromelalgia occur in patients of adult years, differing markedly in this respect from the age incidence of Raynaud's disease, which is more common in younger subjects. More important, however, is the fact that of the cases of erythromelalgia which have been investigated anatomically disease of the blood-vessels seems to be invariably present, affecting the larger trunks, but in many cases also the smaller vessels. The presumption is, therefore, that erythromelalgia is a disease depending upon changes in the blood-vessels, of the nature of an obliterating arteritis, in contra-distinction to the presumed purely functional origin of Raynaud's disease (*vide* also art. "Erythromelalgia," Vol. VII. p. 149).

3. *Necrosis resulting from Disease of Blood-Vessels due to Recognised Causes.*—Under this heading must be grouped numerous cases of necrosis, especially of the extremities, occurring in adult or later adult life in patients suffering from palpable or otherwise obvious disease of the blood-vessels. Of the causes inducing the change in the blood-vessels, syphilis is by far the most important. Other causes, however, must be borne in mind, such as the metabolic disturbances expressing themselves in the symptoms of gout and glycosuria; the effects of acute infective diseases, such as enteric fever; the changes produced in the blood-vessels by ingested poisons of vegetable origin, of which ergotism, and possibly pellagra and alcoholism, may be quoted as examples; and the metallic poisonings, of

which arsenic and mercury are the most important. It can hardly be doubted that the combination of syphilis and the long-continued administration of mercury is a most potent cause of degeneration of blood-vessels.

As it is admitted that cases of true erythromelalgia are invariably associated with obliterative degeneration of the arteries and possibly disease of veins, it follows that the line of distinction between erythromelalgia and the painful forms of gangrene depending upon obliterative

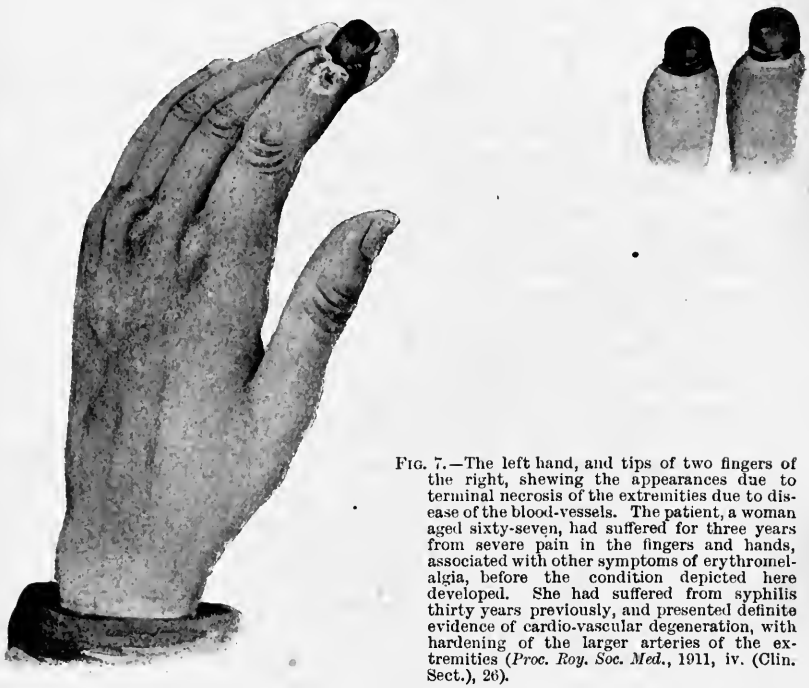

FIG. 7.—The left hand, and tips of two fingers of the right, shewing the appearances due to terminal necrosis of the extremities due to disease of the blood-vessels. The patient, a woman aged sixty-seven, had suffered for three years from severe pain in the fingers and hands, associated with other symptoms of erythromelalgia, before the condition depicted here developed. She had suffered from syphilis thirty years previously, and presented definite evidence of cardio-vascular degeneration, with hardening of the larger arteries of the extremities (*Proc. Roy. Soc. Med.*, 1911, iv. (Clin. Sect.), 26).

arteritis, produced by known causes such as those mentioned, is exceedingly difficult to maintain.

Cases come under observation, not infrequently in persons, usually in later adult life, who suffer from painful flushing of the extremities, much increased when the limb is in the dependent position. The pain is sometimes of the most severe description, of a burning, throbbing, and even lancinating character, and is often distinctly paroxysmal. The area affected by this congestion is fairly well circumscribed, and frequently involves a toe or finger and the neighbouring portion of the foot or hand. These symptoms persist for a varying period, it may be for many months or even years. Sooner or later a patch near the extremity remains permanently cyanosed, gradually blackens, and an area of dry gangrene is recognised. The amount of tissue which becomes gangrenous is rarely

so large as the congested and painful area; the tips of several fingers and toes may thus be destroyed. The symptoms of paraesthesia, pain, and swelling correspond exactly to the description of erythromelalgia. In such cases, however, disease of the arteries affecting the limbs or the heart and blood-vessels generally is easily recognised. In a great proportion of cases other evidence of syphilitic infection is obtainable, and syphilis is, with little doubt, one of the chief causes of the disease. This group of terminal necroses probably extends far into the territory of erythromelalgia.

4. Two groups of cases remain to be mentioned to which attention has been especially drawn recently; Dr. Parkes Weber has described certain cases presenting the phenomena of painful congestion of the lower extremities ending in ulceration or necrosis associated with endarteritis obliterans and intermittent claudication. The tendency for these cases is to end in terminal gangrene or ulceration: the gangrene may be delayed for years, the ulceration is indolent and slow in healing. These cases have occurred especially in poor Jews from Russia, living in the East End of London under unsatisfactory hygienic conditions. The cases occur in adult males, and frequently lead to gangrene in the prime of life. Many of them have been employed in cigarette factories, and Dr. Weber suggests that cigarette smoking may be a factor in the causation. He says in addition: "Syphilis plays no part in the etiology. The really essential cause of the arterial disease in these cases still, however, remains unknown. It is possible that in these cases, for some reason (insufficient exercise, imperfect diet, or too much cold), during the growing period of life, the blood-vessels, especially those of the lower extremities, do not develop in proportion to the growth of the rest of the body. If this were the case it would be natural that during adult life the hypoplastic vessels should be specially liable to disease." Dr. Weber considers the congestion in such cases to be of "conservative" nature, and that it may be explained as an automatic attempt to compensate for the arterial obstruction by dilatation of capillaries and venules, so as to make up for deficiency of arterial supply by increase of the total quantity of blood in the affected part.

5. The special occurrence of gangrene of the extremities in the case of young adult Jews has been noted by other observers. Leo Buerger of New York has also drawn attention to the occurrence of necrosis of the extremities in young adults of the Hebrew race. He has had the opportunity of examining the pathological condition of the amputated limbs in at least twenty-eight cases, and comes to the conclusion that the lesions of the vessels are not due to proliferation of the intima, but are thrombotic in nature, and that in this disease there is extensive obliterating thrombosis in the arteries and less often in the veins of the lower extremities, followed by organisation and canalisation with an attempt at the production of sufficient collateral circulation. He therefore proposes the name of thrombo-angiitis obliterans as being more distinctive of the disease in the class of cases observed by him. He defines thrombo-

angiitis obliterans as "a clinical and pathological entity characterised by thrombotic occlusion of arteries alone, or of arteries and veins, giving subjective manifestations, chief among which are pain and the peculiar symptoms of intermittent claudication, and presenting objective phenomena, the most important of which are redness in the dependent position of the limb, marked blanching in the elevated position, evidence of arterial occlusion in the form of pulseless vessels, trophic disturbances of moderate extent, and of even grave consequence often terminating in gangrene of one or both lower extremities." Buerger regards the group of cases defined by him as not related to either Raynaud's disease or erythromelalgia. Though the exact causation of the cases described by Weber and by Buerger is not certain, it is clear that the gangrenous affection of the extremity is definitely due to failure of the nutrition of the part, owing to vascular disease.

Obstruction of a large vessel is capable of bringing about the results described under the last section, but there can be little doubt that certain forms of necrosis and dystrophy of the skin result from occluding changes in the smaller vessels, arterioles, capillaries, and venules supplying the surface. Certain parts of the body seem especially to suffer from affections of this character. In the lower extremities, the areas of skin extending downwards on both sides of the leg passing behind the external and internal malleoli, and towards the dorsa of the feet, seem specially liable to suffer from necrosing forms of degeneration. Cases occur in which severe pain of the type associated with erythromelalgia affects these regions, and is gradually followed by permanent congestion, which may be purpuric, and finally lead to "ischaemic ulceration," or to actual necrosis. Cases of this kind have been shewn by Dr. Essex Wynter and others.

It is also highly probable that there are forms of degeneration of the skin, associated with mild degrees of inflammation and usually with much desquamation, occurring in elderly persons, the cause of which is an interference with the blood-supply, owing to disease of the finer vessels of the cutaneous circulation; such cases are usually described as varieties of exfoliative or desquamative dermatitis or chronic eczema.

The **treatment** of the forms of gangrene due to disease of the blood-vessels must be unsatisfactory. The changes in the vessels themselves, whether due to a definite disease such as syphilis, to some obscure cause producing thrombosis of arteries and veins, or to changes known up to the present as simply degenerative, are progressive in character. The most favourable prospect is for those cases in which the syphilitic influence is most pronounced. There can be little doubt that careful antisyphilitic treatment by means of iodide of potassium, or with still greater care by mercury itself, produces highly beneficial results. In other cases, such as those in which defective development of the blood-vessels is suspected, or in which the changes are of a simple degenerative character, all reasonable precautions against strain, whether arising from food, work, exposure, or any other cause, must be taken. During the paroxysms of pain, which

are often worse before the occurrence of gangrene, many methods of treatment have been utilised. Usually rest in the horizontal position with warmth is most comfortable. Occasionally temporary relief may be obtained by elevating a limb. In some cases warmth cannot be borne, although it is obviously the most satisfactory way of encouraging the circulation; cold applications, even ice compresses, may then produce comfort. The vaso-dilators, especially the nitrites, for example, nitrite of sodium and trinitrin, have all been carefully utilised in the treatment of these disorders, but with results that are by no means satisfactory. Apart from the cases of syphilitic origin, the administration of iodide of potassium seems in many cases to have a very beneficial effect—it may be of delaying the progress of the disease, at any rate of rendering the patient more comfortable. During the paroxysms of pain the only internal remedy likely to prove of service to the patient is opium, or its alkaloid morphine. During the painful stages, opium appears to be best administered in the form of the crude drug, or in such a combination as the pilula saponis composita, taken in sufficient doses at regular intervals.

Amputation of the gangrenous extremity may become necessary, but is never a grateful task to the surgeon on account of the small possibilities of satisfactory results afforded by the condition of the subjects of these forms of gangrene. In uncomplicated senile gangrene the shock following the amputation is great; and in gangrene complicated by glycosuria or other diseases the prospect is still less satisfactory. In younger persons the pain associated with gangrene of the extremities may render amputation advisable or even compulsory. But even in such cases the prospect is not good either from the point of view of arresting pain, or of avoiding recurrence of gangrene, on account of the widespread disease of the blood-vessels usually present. Recently it has been suggested that an attempt should be made to stop the necrosing process by making the veins, if they are healthy, carry on the functions of the diseased and obstructed arteries. The arterio-venous anastomosis is made by uniting a neighbouring vein to the artery of the limb above the point of obstruction. From the character of the changes in both the arteries and the veins it is highly improbable that this method of obtaining relief is likely to prove successful, and the few cases of the operation attempted do not appear to have given results at all comparable to the remarkable ingenuity of the suggestion.

JAMES GALLOWAY.

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J. G.

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# ANGIOKERATOMA

(ἀγγεῖον, a vessel; κέρας, a horn.)

SYNONYMS.—*Angeio-keratoma* (Anderson); *Telangiectatic warts* (Dubreuilh); *Acro-tele-angiectasia* (Thibierge).

By J. J. PRINGLE, M.B., F.R.C.P.

**Definition.**—A comparatively rare affection of the skin, characterised by warty growths over dilated blood-vessels, generally situated on the hands and feet, and almost invariably preceded by chilblains.

**Historical.**—The first case of angiokeratoma was reported by Dr. Wyndham Cottle in 1877; but the disease did not receive general recognition until Mibelli published his observations in 1889. Some cases were, however, recorded as examples of lymphangiectasis by Dr. Colcott Fox in 1886; and one, as a form of verruca, by Radcliffe Crocker in 1888. Since the publication of Mibelli's article—to whom we owe the nomenclature and most of our knowledge of the disease—examples have been reported by Thibierge, Crocker, Tommasoli, Dubreuilh, Zeisler, Max Joseph, Audry, Brocq, Fordyce, W. Anderson, and myself. The illustrations on p. 77 are from photographs of water-colour drawings of a typical case published in the *British Journal of Dermatology* in 1891. Although the number of cases published is thus few, I have reason to believe that the disease is by no means a very rare one, as I have noticed several examples of it for which no medical advice had ever been sought. This opinion has lately been confirmed by Audry of Toulouse, who has seen between 80 and 90 examples (3).

**Etiology.**—The disease is one of childhood, or of early adult life; and in a considerable majority of cases occurs in the female sex. Several members of a family are often affected, but no instance of heredity has been reported. Its subjects are generally liable to chilblains, cold, puffy, clammy hands and feet, local asphyxias, and other evidence of disordered peripheral circulation. Vidal has shewn that a condition practically identical may follow an attack of urticaria. The immediate cause is often exposure to unusual cold. The relation of the disease to tuberculosis

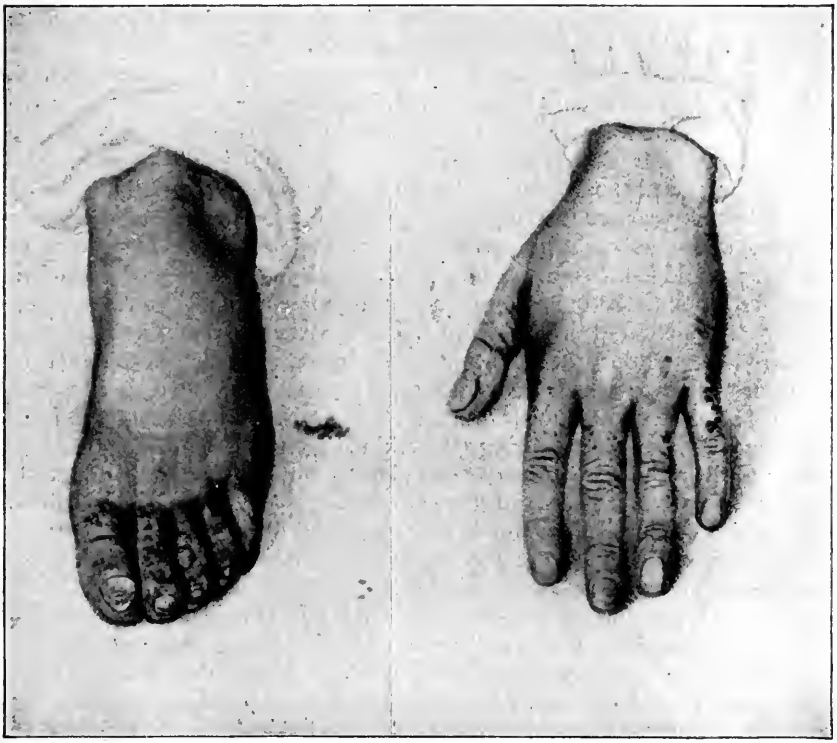

FIG. 8.—Angiokeratoma of hands and feet. (Cases published in *Brit. Journ. Dermat.*, Lond., 1891, iii.)

is curious and interesting. Cases reported by Drs. Colcott Fox, Galloway, Leredde, and others, were associated with various tuberculous phenomena (phthisis pulmonalis, erythema induratum scrofulosorum, cervical adenitis, etc.), and Leredde regards the disease as a "toxi-tuberculide" standing in the same relation to the bacilli of tuberculosis as does lupus erythematosus; but this opinion has not received general acceptance.

**Pathology.**—As the result of repeated congestion, the capillaries in the papillary layer become permanently dilated, compressing the neighbouring epithelial ridges. Ultimately the papillae are transformed into cavernous blood-spaces, which may extend through the rete Malpighii as

far as the horny layer. There is considerable thinning of the elastic fibres, which are in places transformed into masses of elastin (Judin). In my own cases there were considerable inflammatory infiltrations of the papillary layer, and downward hypertrophy of the prickle layer; and the sweat pores were obviously narrowed by pressure. The lymph-spaces also are often filled with extravasated blood. Acanthosis is never well marked (Unna), but the stratum corneum is enormously hypertrophied, its basal layer being rich in eleidin. The condition thus shews marked differences from true warts. That the keratoma element is secondary to the essential vascular changes, and in some sense accidental, is obvious from Dubreuilh's and other aberrant cases referred to below.

**Symptoms.**—The appearance of the characteristic lesions is almost invariably preceded by chilblains, recurring on the hands and feet year after year during cold weather, the attacks differing in no way from ordinary chilblains. After a variable period, as the chilblains subside, the dorsal surfaces of the phalanges of the fingers and toes are found to be studded with minute, scattered telangiectases, shewing themselves as blood-red puncta, which at first disappear on moderate pressure. In process of time, as the blood-vessels enlarge, and fresh ones undergo dilatation, these red points become more and more difficult of obliteration, and finally are unaltered by pressure, although the surrounding tissue is rendered exsanguine thereby. The telangiectases range themselves in little groups, over which the epidermis becomes thickened, horny, and opaque, so as to constitute dry, grey, wart-like patches, often of considerable hardness. On stretching the skin of the part, or on exerting pressure with a piece of glass ("diascopy"), the elemental telangiectases can generally be detected; and there are usually—even in the most extreme cases—scattered vascular puncta, accompanied by little or no keratosis, which give a clue to the nature of the case. In the majority of cases all the stages of the morbid process can be observed simultaneously. The palms and soles sometimes become involved, but always to a less degree than the dorsa of the hands and feet; and in a small number of cases an exactly similar series of phenomena has been observed in the pinnae of the ears. Occasionally, after accidental injury to these areas, bleeding may be extremely difficult to control. The lesions are always bilateral, but never accurately symmetrical. No subjective symptoms are complained of, as a rule, but occasionally some burning or itching is caused by congestive attacks of "chilblainy" character. The disease first begins in childhood or adolescence, usually in persons of weakly constitution; and during the first few years crops of lesions succeed chilblains every spring, or may—as in one of the six cases I have observed—appear independently of congestive lesions. Generally speaking, the condition becomes stationary and indefinitely persistent at adult life, or even earlier. Spontaneous disappearance both of warty and telangiectatic elements has been reported by Dr. Colcott Fox in tuberculous patients.

*Variants.*—Dubreuilh describes cases typical in every respect as to seat, relationship to chilblains, and so forth, but in which the

keratoma element was entirely absent. Fordyce, Zeisler, and Anderson report, as cases of this disease, some which are anomalous as to distribution and other features. In Fordyce's case the lesions (in a man aged sixty) were confined to the scrotum; in Zeisler's (a man aged fifty-four, affected for only four years), in addition to typical lesions on the hands and feet, numerous angiomas and wart-like tumours were present over the arms and legs; whilst in both Fordyce's and Zeisler's cases many patches of vitiligo were present in various situations over the body. In W. Anderson's case the affection began over the knees at eleven years of age, and spread over nearly the entire trunk and upper limbs; the hands and feet being almost completely free. In all these anomalous cases, not only was the distribution of the disease aberrant, but the chilblain element was absent, and the keratoma of very low degree. A similar but probably different disease has been described by Beck in a man sixty-six years of age without antecedent chilblains.

The **prognosis** may be inferred from the foregoing sketch.

**Diagnosis.**—If the condition be familiar to the observer no difficulty can arise. Possibly true or tuberculous warts might be mistaken for angiokeratoma, or more probably lymphangiectases of the extremities. These latter may, indeed, complicate the condition to a greater or less extent.

**Treatment.**—In two cases under my care successful results were obtained by electrolysis; a needle was connected with the negative pole of the battery, and a current of 3 to 5 milliamperes passed into dilated vessels until coagulation ensued. The number of lesions to be treated at a sitting depends mainly on the courage and endurance of the patient. In some cases an anaesthetic may be required. The micro-cautery has been used also with fair results, but necessarily causes considerable scarring. In some cases excision may be advisable. All measures calculated to prevent the occurrence of chilblains and allied conditions must, of course, be taken.

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# DISEASES OF THE SKIN PRODUCED BY OCCUPATIONS

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CUTANEOUS diseases frequently result from direct mechanical injuries, or from contact with the noxious substances encountered in various occupations. The clinical characters of these affections do not as a rule differ from those of the ordinary forms of inflammation of the skin, but some forms are peculiar, and will be mentioned later. It is, however, necessary to note that certain congenital or acquired states of the skin predispose to the eruptions now under consideration. It is important to bear this in mind both in the treatment of the forms of skin disease which may ensue and because this knowledge will enable us to warn patients thus vulnerable against engaging in occupations likely to induce the diseases to which they are prone.

The following conditions are of importance as predisposing causes to various occupation-diseases.

*Ichthyosis and Exfoliating Diseases.*—Ichthyosis is a congenital affection of the skin and occurs in all degrees of severity (*vide* p. 12). In the most severe cases the skin is so liable to external injury and responds by inflammatory attacks of peculiar character and of such a long duration that the individuals affected are quite unable to undertake any arduous mechanical work. But short of these severe conditions the milder degrees of ichthyosis render the patient liable to unnatural dryness, scaliness, irritability, and inflammation of the skin. In the mildest form the skin of the palms and the soles shews the evidences of the disease when little of an abnormal character may be observed elsewhere. In such cases manual labour is often performed with difficulty, and is apt to cause cracking and fissuring of the hands and consequent eruptions of infective dermatitis. As might be expected, all cases of ichthyosis are not equally liable to injury as the result of exposure. A man, aged seventy, under my care at Charing Cross Hospital, with the effects of widespread arteriosclerosis, has general ichthyosis. He has, since boyhood, been well known in the neighbourhood of Charing Cross; his occupation, that of a costermonger and flower-seller, has entailed continuous exposure, yet he has not suffered markedly from this particular kind of irritation. But, on the other hand, there can be little doubt that some forms of general erythematous and exfoliative dermatitis have their foundations in the ichthyotic state, and are likely to be produced by exposure to certain forms of irritation.

In addition to true ichthyosis there are other exfoliative conditions appearing in infancy, and no doubt of congenital origin. These are apt to give rise to certain primary forms of exfoliative dermatitis, which can only be kept in check by most careful and assiduous treat-

ment. In these cases manual work or exposure of the skin to any form of mechanical or chemical injury may set up severe attacks of acute erythematous and exfoliative dermatitis. These conditions are well exemplified in the case of a patient originally described by the late Dr. Sangster and long under my observation.

*Epidermolysis Bullosa.*—This comparatively rare affection is also of congenital origin, and the condition of the tissues permitting of the disease may be looked upon as the type of skin easily injured by mechanical causes. In severe cases the injuries which result in the characteristic bullous lesions are so trifling as to pass altogether unnoticed, and the eruption appears to occur spontaneously, and becomes complicated by infective inflammations and a gradually increasing atrophy of the skin. Such patients are almost precluded from manual occupation, and can lead a bearable existence only when guarded with extreme care. Some individuals, however, suffer in a slighter degree from the condition; they are prone to blister easily as the result of slight injury, the character of the so-called blisters betraying the patient's real condition. Sometimes the condition becomes obvious when a lad commences manual labour; the bullous eruption of the hands is then noted, it may be for the first time, and a continuance of the occupation becomes impossible (*vide* art. p. 460).

Certain other diseases of obscure causation render the skin liable to injury, and to the appearance of eruptions of unusual character. One of the best examples are the eruptions of urticaria pigmentosa, a disease which occasionally begins during adolescence and in young adults instead of in the earlier years of life, and may therefore coincide with the period when laborious occupation is first undertaken (*vide* art. p. 233).

*Special Liability to Atmospheric Influences.*—Exposure to cold and heat, and to the rays of light, has the effect in susceptible persons of producing various painful diseases of the skin. Easily recognised forms of painful congestion of the extremities resembling in their features the milder forms of Raynaud's disease, result from exposure to cold and heat. Some attacks of lupus erythematosus appear to be caused or to be specially influenced by exposure to the direct rays of the sun. At one time I had the opportunity of observing cases of lupus erythematosus in watermen employed on the Thames steamboats. Cases of the disease were apt to appear during the hot, sunny weather, and the sufferers considered the exposure to the direct and reflected rays of the sun, necessary in their occupation, as either the cause of the disease or a very efficient means of intensifying the eruption. The well-known class of vesicating and atrophying eruptions, occurring sometimes during the summer, in other cases during the winter time, exemplified by the well-known hydroa aestivale, is another instance of serious inflammation of the skin resulting in those exposed during occupation.

One of the most interesting examples of unusual proneness to irritation by light is the condition known as *xerodermia pigmentosa.* The individuals developing this most trying affection usually occur in family

groups; apparently under the influence of light rays they develop intense irritation of the skin, followed by a peculiar type of pigmentation, and finally epitheliomatous growths of the most distressing character. The sufferers from this tendency develop the eruption in a marked form when they first become exposed to bright sunlight, and are necessarily debarred from outdoor occupation (*vide* art. p. 611).

Over and above the conditions already noted, which are of congenital or developmental origin, certain other affections of the skin which may arise at various periods of life predispose to occupation-eruptions.

*The seborrhoeic state* is one of the most important of these. The various forms of dermatitis which arise in this condition are very easily excited by exposure, mechanical irritation, by the increased secretion of the glands caused by exertion, and especially from faults in the care and cleanliness of the skin almost inevitable in those who have to earn their living by manual labour. The seborrhoeic state underlies many forms of eczema-like inflammation, and the sufferers are prone to pyogenetic infections and suppurative dermatitis.

The very troublesome condition known as *dysidrosis* (*vide* p. 664), characterised by a vesicular eruption affecting especially the palmar and plantar surfaces of the hands and feet, and the clefts of the fingers and toes, renders the affected parts not only painful, but easily infected by pyogenetic micro-organisms. It thus leads to attacks of suppurative dermatitis of the hands and feet, especially in those who lead an active life. The sufferers from this condition appear to have an inherent structural defect in the epidermis of the hands and feet which renders them liable to the characteristic pompholyx lesions; but in addition certain irritants seem to have the power of inducing the eruption in those who may have only a slight degree of original susceptibility. Thus, certain persons with a slight predisposition to this condition suffer from serious attacks of the disease after handling various irritating substances, such as turpentine and volatile oils. The violent attacks of pompholyx which occur on handling these substances resemble in some degree the attacks of dermatitis following contact with certain irritant plants, such as the various species of rhus, but the dysidrotic attacks are of much longer duration, and tend to easy recurrence. In labourers the disease is often very troublesome, and, being in such cases frequently complicated by hyperidrosis, it not only produces the pain characteristic of the eruption of pompholyx, but readily passes on to pyogenetic inflammation of the hands and feet, with the consequences of glandular enlargement in the groin and in the axilla, suppuration and abscesses in these localities, and severe septicaemia. In one case a large glandular abscess formed in the groin in a dock labourer suffering from true dysidrosis complicated by pyogenetic infection; the abscess threatened the patient's life by inducing an attack of peritonitis. Even in its milder degrees the pain of the eruption often forbids manual occupation, and especially the handling of the irritant materials likely to induce an attack. A patient under my observation who possesses considerable skill as an artist com-

menced to suffer from severe attacks of dysidrosis when she attempted to practise painting in oils.

The occurrence of certain other diseases of the skin necessarily prevents manual labour, and other occupations, except at the risk of attacks of disease. The presence of the "*pemphigus*" group of affections, especially dermatitis herpetiformis, renders the sufferer prone to incapacitating attacks of inflammation of the skin much intensified by almost any occupation. In the same way the occurrence of the *exfoliating group* of affections of the skin will render the sufferer incapable of manual labour or any strenuous employment except at the imminent risk of attacks of severe dermatitis.

*Diseases of the nervous system*, especially those characterised by changes in sensation and by trophic disturbances of the skin, are also causes of certain occupation-diseases. Syringomyelia may be taken as an example of the nervous diseases in question; the loss of sensation to heat, cold, and pain, while ordinary primary contact sensation persists, accounts for the extreme facility with which the skin may be injured, and for the liability to vesicular and bullous eruptions on the limbs. Such patients may burn or scald the hands without being conscious of pain, and are apt to allow inflammatory and suppurative affections of the nails, fingers, and hands to persist without proper care on account of the absence of discomfort. Even when the symptoms of the disease itself are not sufficiently advanced or severe to interfere with the general health, precautions must be taken against even the ordinary risks of injury.

Certain other morbid conditions affecting the general health have an important bearing upon the fitness for occupation of those affected, and in some cases render the subjects more liable to injury and disease of the skin. Perhaps the most obvious of these depressing conditions is diabetes mellitus. The changes in nutrition produced by this disease have a serious effect upon the skin. The dryness of the epidermis so commonly noticed is often associated with irregular or increased keratinisation of the epidermis of the feet and hands. This leads to the formation of cracks and painful fissures which may make walking and manual occupation impossible. Trophic disturbances, perforating ulcers, necrosis of the extremities, and liability to pyogenetic infection are ready to make their appearance in those suffering from this error of metabolism, and this tendency is increased by exertion and manual occupations.

Other conditions of malnutrition ending in necrosis, especially of the extremities, and associated with functional or organic disease of the blood-vessels, some of which have only recently been investigated, render the individuals who suffer from these disorders unfit for arduous occupations.

In considering the occurrence of disease produced by occupation these special proclivities must be borne in mind. The diseases themselves in most cases conform to well-recognised morbid changes in the skin, and are best considered under general headings.

**Hyperkeratosis.**—Mechanical pressure, if intermittent, produces an increase in the thickness of the epidermis, especially of its horny layer. This increase is manifested in various forms of hyperkeratosis, such as callosities, corns, and similar lesions, and in the thickened epithelium of the hands of handicraftsmen. The nature of the occupation is sometimes indicated by the position of the callus; thus, carpenters have areas of horny epidermic thickening where their tools press on the palms of their hands or on the thenar eminences; performers on stringed instruments, such as the violin and the harp, have similar thickenings at the points of their fingers. Oarsmen, tennis-players, and cricketers develop callus on slightly different positions on the hand. In certain congenital forms of hyperkeratosis the increase of epithelium due to occupation becomes especially noticeable.

**Increase of Pigmentation.**—Pigmentary changes are not infrequently seen as the result of occupation, especially as the result of exposure to atmospheric influences or as the result of inflammatory attacks. These changes are nearly always in the form of local increase of the normal pigment. Many varieties of chronic trade-dermatitis leave local increase of pigment, and certain individuals shew a special idiosyncrasy to this increase. Not infrequently a past attack of chronic eczematous inflammation on the face or other parts of the body may be betrayed by the remaining pigment. Pressure may also produce dermatitis and more rarely cause local pigmentation, a phenomenon of special importance in the etiology of pigment-bearing new growths. The better-known forms of increased pigmentation occur in persons whose occupations expose them to the direct rays of the sun. The ordinary pigmentation of sunburn is well known; the tendency to the localised pigmentation of the freckle is a matter of daily observation, but it is especially noteworthy that in certain cases such pigmented areas, often attended with a certain amount of surrounding dermatitis, precede degenerative changes of the cutis and epidermis. The destructive change which follows this kind of pigmentation is well seen in the very remarkable disease xerodermia pigmentosa (*vide* p. 611). Pigmentation with atrophic changes in the skin occurs not infrequently in the extremities and even in other parts of the body, and may be the basis for the origin of certain forms of carcinoma. The most striking example of this form of occupation disease is that resulting from exposure to the *x*-rays; but long-continued and repeated attacks of chronic dermatitis from other causes produce an analogous sequence of events.

**Erythema and Bullous Eruptions.**—Many occupations render those following them liable to eruptions of this class, and as the degree of irritation necessarily varies, it is often difficult to say whether an eruption beginning as an erythema will advance so as to produce vesicles and bullae or not; in the more severe forms of irritation all the lesions following irritative congestion of the skin may result. Those occupied in handling substances containing volatile oils or giving off noxious vapours suffer much in this way, and the descriptions of many varieties

of dermatitis venenata are applicable to this kind of trade eruption. Examples are commonest among workers in turpentine, varnish, volatile chemical substances, and aniline dyes. The handling of resins, the varieties of tar, and such drugs as chrysarobin, usually leads to some degree of erythema, which may readily become severe or even produce vesication. Workmen who handle aromatic substances such as volatile oils obtained from flowers and other parts of plants, and fruits such as oranges, suffer from eruptions not unlike erythema bullosum. Aromatic and resinous woods are frequently the cause of a similar type of eruption on the hands of carpenters and cabinet-makers. For instance, the use of teak has been shewn to be not an uncommon cause of acute erythematous and vesicating eruptions on the hands of carpenters handling it; and, as is so frequent in similar cases, an attack of dermatitis occasioned in this way renders the individual more liable to recurrences on very slight exposure.

Gardeners have long been aware that the handling of various plants causes irritating and persistent skin eruptions. The introduction of certain plants from abroad in recent years has familiarised those interested in their gardens with these irritating properties. For instance, certain exotic members of the order Primulaceae (*Primula sinensis*, *P. obconica*), favourite plants on account of their showy blooms, very frequently produce acute erythematous and vesicating lesions. Not infrequently patients complain of recurrent attacks of erythematous dermatitis which can be traced to gathering and arranging these flowers. The bulbs of certain liliaceous plants also possess irritative properties. More recently various species of the Rhus family (*Anacardiaceae*), possessing handsome foliage, have been imported and planted in shrubberies, and have given rise in this country to attacks of the "Rhus dermatitis," long familiar to residents in the United States, Japan, and other localities where *Rhus toxicodendron*, *Rhus radicans*, the "poison ivy," *Rhus vernix*, "poisonous sumach," and other species of the family are native.

**Dermatitis of Eczematous Character.**—The majority of diseases of the skin produced by occupations resemble eczema during at least part of their course, and if eczema is used in the wide sense signifying the ordinary reaction of the epidermis and cutis to irritation, the usual term of trade eczema may with reason be applied to these occupation diseases. The mineral dust arising in many handicrafts is a well-known cause of this form of dermatitis. Examples are frequently seen in the case of sand-paper makers, steel-grinders, masons, plasterers, stone-cutters, and others. The dust of vegetable or animal substances is frequently the cause of severe and inveterate forms of this type of dermatitis; it acts not only mechanically, but also on account of the noxious chemical substances that this dust contains. Examples are frequently noticed in workers in jute and hemp, in flax- and cotton-dressers, workers in rags or wool, fur-trimmers, and hair-dressers. The obscure origin of such attacks of inflammation is well illustrated in the case of what is known as "barley itch," a disease attacking the hands, arms, and often the whole

surface of the body in labourers engaged in unloading cargoes of barley, especially from foreign ports. In one such outbreak it has been almost certainly proved that the irritative material producing the inflammation of the skin was not the barley—its awns or hairs—but the exceedingly irritating hairs of *Mucuna pruriens* which were found attached to the barley and also in the skin of those affected by the disease. A well-known form of eczematous eruption is met with in workmen who handle the varieties of cinchona bark used in the manufacture of quinine. As in the case of most eruptions of the class, it is found that certain workmen are especially prone to cinchona dermatitis, and the slightest contact with, or even the neighbourhood of, the bark seems to be sufficient in those susceptible to produce the eruption. The eruption is usually accompanied with much itching, and most commonly affects the face, hands, and forearms.

Many chemical substances used in manufacture or as testing reagents are known to produce irritation of the skin. The most troublesome are those that are volatile or aromatic, and, as is to be expected, some individuals are unusually prone to suffer from their irritant effects. A very good example of this group of substances is phenyl-hydrazine. A recent case of skin inflammation due to this reagent under my observation occurred in a young man engaged in chemical study. While working in the laboratory he accidentally spilt over his clothes a quantity of phenyl-hydrazine hydrochloride in solution. The clothes were rapidly changed, and the patient on this occasion suffered only from a slight attack of dermatitis, to which comparatively little notice was given. Some weeks after, on returning to his home, he wore the same garments over which the phenyl-hydrazine solution had been spilt. In a day or two he began to suffer from irritation of the skin which developed into severe erythematous, vesicating, and eczematous dermatitis of the whole surface of the body—face, trunk, and extremities—in varying degrees. The discomfort, pruritus, and irritation were intense, and a considerable amount of constitutional disturbance also occurred. An example of the extreme liability of certain persons to suffer from the effects of this chemical reagent is also recorded by Dr. Arthur J. Hall. Many other irritating chemical substances are apt to produce dermatitis of somewhat similar characters. Of these camphor, bisulphide of carbon, phosphorus, chlorine, iodine, aniline and its compounds, the fumes produced by the smelting of various ores, such as those of copper or zinc, may be mentioned.

A very definite form of eruption characterised by erythema, papules, vesicles, pustules, and even ulceration occurs in persons concerned in the manufacture and in the handling of the more volatile metals, especially arsenic, antimony, lead, and mercury. Examples are seen in the case of artificial-flower makers, mirror manufacturers, painters, dyers, tanners, and taxidermists. The various eruptions and severe disturbances of the skin following prolonged absorption of arsenic are now well known. Recent epidemics of chronic arsenical poisoning have aroused the public attention to the danger of arsenic in this respect. It should be recognised

that similar affections occur, not only in those who have taken arsenic for long periods as a drug or as an impurity in food, but also in those who have to handle the preparations of this metal. In the case of mercury also the signs of acute and chronic mercurial poisoning are well known, not only to the profession, but to the public. It is not, however, so well recognised that various types of general erythematous and even of severe exfoliative dermatitis may follow the absorption of mercury and produce grave disease. The manufacture of chromic acid and its salts is known to produce severe, irritating eruptions of the skin in those engaged in the occupation. The irritation not only may produce eczematous dermatitis, but frequently gives rise to chronic ulceration of the skin, which heals badly. Those engaged in the manufacture of alkalis and acids, as is to be expected, also suffer from attacks of inflammation of the skin. Not infrequently printers, compositors, and especially those engaged in cleaning the type suffer from inflammation of the skin. Those engaged in printing have not only to handle metals capable of giving rise to chronic metallic poisoning, especially lead, but alkalis, turpentine, and other irritant substances necessary to clean the type, and these cause troublesome and persistent attacks of dermatitis.

**Diseases of the Appendages of the Skin.**—Certain occupations produce eruptions due to changes in the hair follicles, sebaceous and sweat glands. It is frequently suggested that persons engaged in sedentary occupations are more likely to suffer from the seborrhoeic group of eruptions, and especially from acne, than others who have the advantage of being much in the open air and able to take exercise; but it must be remembered that those who lead sedentary lives, such as clerks, seamstresses, compositors, cigar- and cigarette-makers, are exposed to conditions far from wholesome. Too often they are so crowded together in ill-lighted, badly ventilated apartments that their personal health deteriorates; whilst the necessity of close contact and lack of cleanliness render transference of contagious elements easy. In this way the micro-organisms responsible for impetigo and other pyodermic disorders, folliculitis, and possibly those associated with seborrhoeic "eczema" are readily transmitted. Few of these persons are in so perfect a condition of health that infective influences are easily kept in check.

The oil, grease, and tar used in many occupations tend to produce eruptions, first of all by blocking up the orifices of the cutaneous glands, followed by retention of secretion. These minute retention-cysts are readily infected by pyogenetic micro-organisms. Workers in paraffin who are brought in contact with the crude oils obtained from the shale frequently suffer from dermatitis of this character. Reddened papules round the mouths of the hair follicles appear on the backs of the hands, the forearms, and other hairy parts. The mouth of the follicle becomes distended, and is usually filled out with a black plug composed of epithelium and foreign materials. Distention of the duct and sebaceous gland takes place below the plug; suppuration may occur in such follicles and all degrees of inflammation may result. If the disease becomes

chronic, cracks, fissures, and thickening of the skin are so troublesome that the workmen are obliged to abandon their occupation.

A form of eruption very similar to this occurs in workers in creosote and tar, and is known as "tar acne." The different forms of tar produce, first of all, erythema, which may be of great intensity, and will result in dark-purple congestion and long-standing pigmentation. The tar tends to block the follicles, producing very characteristic black spots at their orifices. An eruption of papules and nodules results from the formation of the retention cysts. These nodules are apt to suppurate, and may give rise to ulceration. The eruption is sometimes very profuse on the backs of the forearms, the hands, and on the thighs. Occasionally, as in other forms of chronic dermatitis arising in similar ways, it is followed by squamous-celled carcinoma.

The affection known as hidrocystoma seems to occur most readily in women, either during warm weather or as a result of their occupation as in the case of washerwomen. Small cystic tumours of irregular volume, usually not larger than a split pea, are symmetrically disposed on each side of the face, more especially on the central areas. These tumours are cysts in all probability connected with the sweat apparatus (*vide* p. 648).

**Contagious Diseases.**—Many diseases resulting from contagion are associated with various occupations. Grooms and those in charge of horses and cattle not infrequently suffer from forms of trichophytic disease resulting from the infection of the human subject by trichophytons with special characteristics. The trichophytons concerned often differ in biological characters from the ordinary human ringworm fungi, and may be the special parasites of the species from which the infection originates. These animal ringworms frequently produce a peculiar type of suppurative folliculitis of the skin of the body as distinct from the scalp, one of the varieties of which was long recognised under the name of "folliculitis agminata." Many cases of trichophytic disease are traceable to infection from other domestic animals, such as cats. In the same way the different forms of pox—horse-pox, cow-pox, and the corresponding disease of sheep—are not uncommonly transmitted to those in charge of these animals, and the eruptions so produced are frequently very severe. The attacks of animal pox not infrequently occur on the faces of those attending the affected animals, and the consequence is not only an exceedingly disfiguring eruption, but an illness of great severity associated with high fever and much constitutional disturbance.

Various diseases resembling itch produced by different arachnoid species have also been noted in the human subject. The most peculiar of these are the strange wandering eruptions which are supposed to result from the burrowing under the epidermis of larval forms of certain acari. Painfully familiar to a much larger number are the violent and exceedingly pruriginous eruptions due to the irritation produced by such acarians as the harvest mite. Those engaged in husbandry are specially liable to suffer from these eruptions, but this trying affection may also be regarded as an occupation disease of the holiday-maker who unwittingly

spends the hours of a warm summer afternoon on the turf of the chalk downs, especially of our southern counties.

Tanners and wool-sorters frequently suffer from anthrax and other consequences of infection by the *Bacillus anthracis*. Examples of the peculiar erythema of the hands known by the name of erythema serpens or erysipeloid come occasionally under observation. There can be little doubt that the disease is of infective character, and results from the handling of poultry, game, and perhaps certain other forms of animal food. In this connexion must be mentioned the troublesome dermatitis affecting the hands of those engaged in winding silk from the cocoons of the silk-worm — the "mal de vers" of French writers. Butchers, as is to be expected, are liable to suffer from certain infective conditions as the result of their occupation. Cases of bullous and vesicular eruption resembling pemphigus are known to occur in slaughtermen and meat salesmen, and are strongly suspected to be the direct consequence of their occupation (*vide* p. 427).

The verruca necrogenica is a well-known form of infective disease of chronic inflammatory type, in some cases no doubt a chronic variety of cutaneous tuberculosis, occurring on the hands of those who have to conduct necropsies, as well as in those who have to handle the carcases of animals infected by tuberculosis (*vide* p. 483).

The special contagious diseases of the human subject are most commonly found in persons brought into direct contact with each other, thus the venereal diseases are specially prevalent among prostitutes. Other diseases, such as molluscum contagiosum, scabies, ringworm, various pyogenetic infections, and the infectious fevers too often attack nurses, doctors, and other attendants upon the sick. Persons who travel much, and especially commercial travellers in the past were more particularly liable to suffer from scabies, pediculosis, and pyogenetic and other forms of sycosis. At the present day, however, when the holiday season is nearing its end and voyagers abroad have returned to their homes, it is surprising to find the number of cases of scabies and other contagious diseases which make their appearance in individuals little liable to such diseases in their ordinary mode of life. There can be little doubt that the crowded hotels in the well-beaten tracks affected by the tourist, the sleeping-cars occupied by frequent relays of all sorts and conditions of men and women have much to answer for the autumnal epidemic of scabies in the well-to-do. Liability to these parasitic diseases, however, is most common among vagrants and the occupants of poor lodging-houses. Chronic pediculosis in debilitated persons gives rise to the well-known maculae ceruleae of the "vagabond's disease."

**The treatment of occupation diseases** of the skin must be carried out on the lines recommended for the various forms of injury and of inflammation produced. The first and most important condition is to enable the sufferer to avoid or prevent the injury causing the disease. In many cases this is an impossibility, and the patient has to give up his work. In other cases the irritating causes may be much mitigated. It is

unfortunate that some individuals are much more prone to the diseases produced by their occupations than are others, and it is also the case that a dermatitis, once excited, renders the sufferer liable to renewed attacks on very slight exposure. In the case of the more serious defects of the skin, such as that underlying epidermolysis bullosa, the liability to injury is so excessive that any sort of manual occupation is rendered impossible. The treatment of the forms of dermatitis produced varies with their characters; but, speaking generally, in the earlier stages, rest of the affected part and avoidance of the irritating cause are the first necessities. During the inflammatory and often highly pruriginous stages, soothing lotions, such as those containing lime water and oil, weak solutions of the subacetate of lead, and it may be appropriate antiseptics in the case of the infected eruptions, are necessary. As soon as possible it is advisable to give up the use of moist, macerating preparations, to dress the parts at first with pastes, such as the unguentum zinci, or with ointments such as various cold creams, for example, the unguentum aquae rosae. Later the parts should be kept as well protected and as dry as possible, to allow sound healing of the injured cutis and epidermis. The use of dusting powders, containing the siliceous earths, zinc oxide, carbonate, or oleate is often sufficient to soothe irritation or pruritus, and avoids the necessity of softening the epidermis.

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J. G.

# FEIGNED DISEASES OF THE SKIN

By James Galloway, M.D., F.R.C.P.

Injuries to the skin simulating more or less closely some of its diseases are produced under many different conditions. They may occur accidentally, but are more usually purposely produced by impostors and malingerers to obtain alms, by hysterical young women and others in order to excite sympathy, or to avoid work or irksome duty. In persons of badly-balanced nervous constitution such acts spring from less intelligible morbid impulses, often difficult or impossible to explain by any normal process of reasoning.

The diseases which may be thus simulated are necessarily limited in number; the means employed are nearly always some form of mechanical or chemical irritation of the skin, the resulting lesions being inflammatory in type. Thus, various forms of erythema, vesicular and bullous lesions may be produced and may, in severe cases or in persons of peculiar constitution, pass on to purpuric eruptions or even to local gangrene. As a later consequence of these disturbances ulcerations may occur often difficult to heal, and still later scarring and pigmentation may be produced. On the other hand, it is obvious that such conditions as ichthyosis, psoriasis, molluscum contagiosum, or carcinoma cannot be feigned with any likelihood of success.

As a rule, feigned diseases of the skin can be readily recognised, especially by those who are fortunate in having some dermatological experience. The sex or condition of the patient, the presence of other morbid mental phenomena, the difficulty or impossibility of obtaining a connected and intelligible history of the case will all be of service in forming an opinion, but the physician will depend mainly on the character of the lesions. Thus erythema multiforme, urticaria, pemphigus, herpes, and dermatitis herpetiformis are among the diseases simulated; yet to the trained eye the artificial lesions always present differences from the true disease, which suffice to arouse suspicion as to their mode of origin. The distribution of the lesions is frequently of assistance in forming a diagnosis; for in feigned disease they are most commonly on the face or extremities, and in right-handed persons predominantly on the left side—that is to say, on the readily accessible portions of the body. In other cases the lesions are distributed so as to display a pattern, as when an irritant has been applied on a bandage, or on the other hand, the skin covered or protected by the bandage remains intact whilst the surrounding areas are affected. Again, if a fluid irritant has been employed, outlying spots or streaks may be noted where the fluid has "run" during its application.

In the case of other injuries, especially those presenting ulceration,

considerations which are frequently of service in diagnosis are the recognition of the healthiness of the patient, the characters of the ulcer itself, its colour and shape, its rapidity in healing, its facility of recurrence, as well as the presence and character of marks and scars resulting from earlier lesions; not infrequently the odour, as when acetic or carbolic acid has been used, may be of assistance in determining the diagnosis.

These points strike the experienced observer at once, and go far to lay the foundation of a proper explanation of the case; but cases occur from time to time which succeed in deceiving even the most skilled. This mistake is especially likely to occur with regard to individuals of whom it can be said, "she can have no motive for doing this." In dealing with persons who are on the borderland of truly abnormal mental states, it is unreasonable to expect to find a motive which can be thoroughly appreciated by persons of normal mental development. The motive of a sturdy mendicant or malingerer is readily understood, but a person who is on the borderland of insanity does not act under the usual motives, and these cannot be found even on searching for them; nevertheless, the morbid motives exist, and the individuals affected may have even abnormal acuteness in carrying out the actions they provoke, even when they result in producing injuries to the body.

It is instructive to look over the transactions of the medical societies and to observe occasionally that a patient suffering from some peculiar form of erythema or pemphigus is brought forward for demonstration. During discussion doubts may be thrown on the authentic character of the disease, to the annoyance of the doctor describing or shewing the case. In due course of time a further report is noted to the effect that in the matter of the peculiar case of dermatitis exhibited at a former meeting by him, continued observation shewed that the eruption was undoubtedly artificial, and that the patient was either insane, or proved to be a malingerer. A trained nurse with a previous good record, who has acquired the trick of so manipulating the clinical thermometer as to shew "temperatures," has great possibilities before her of skilfully feigning skin disease. Some of the cases which have proved most difficult to detect have occurred in nurses.

The recognition of feigned skin affections is rendered much more difficult if the patient is unusually liable to certain forms of disease. Thus, an artificially induced eruption resembling urticaria is exceedingly difficult to recognise in a person who is liable to factitious urticaria or dermographism, or who may have developed the tendency to the chronic type of this disease, and in those rare cases in which factitious urticaria seems to pass into factitious purpura, the production of a feigned haemorrhagic eruption would be extremely difficult to identify. Similarly in cases of haemophilia difficulties of the same type present themselves.

Again, many drugs are known to produce various forms of dermatitis. Thus iodide of potassium produces a characteristic vesicular, pustular, or bullous eruption which may even become haemorrhagic. Such drugs are rarely taken for the purpose of deception, but if they are being

administered when the patient is attempting to feign disease of the skin, the diagnosis may become very difficult; perhaps some of the so-called neurotic haemorrhagic eruptions have this origin.

The substances used to produce eruptions on the skin artificially are many. The most usual are fluids, containing acids or alkalis, most commonly those that are readily obtained, for example vinegar, acetic acid, carbolic acid, nitric acid, sodium and potassium carbonate, liquor potassae, and common salt. Solutions containing other irritant materials are also frequently used, such as cantharides and nitrate of silver, and the

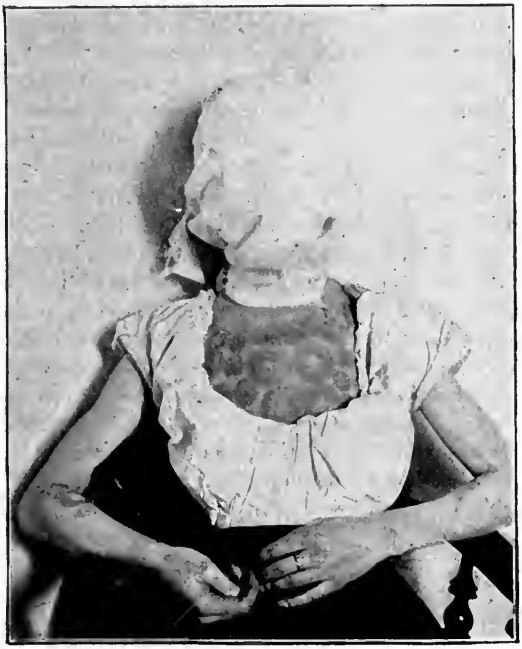

FIG. 9.—Feigned eruption resembling erythema multiforme affecting the chest and right forearm in a young woman with well-marked hysterical and nervous characteristics; she was left-handed.

irritant volatile oils, such as turpentine, are not infrequently pressed into the service. Much ingenuity is shewn occasionally in the search for irritant substances which may not be easily recognised. Mechanical injury, as by means of pins, needles, knives, and surgical instruments, by binding a copper coin tightly on the skin, is sometimes made use of, and severe damage to the surface may result. Diligent rubbing of the skin with the moistened finger is sufficient to set up a dermatitis which may be difficult of recognition or serve to perpetuate a lesion first produced by some other means of irritation. The skin may be burnt with matches or coloured by black lead and other pigments; indeed the ingenuity of the determined malingerer may lay almost every known irritant under contribution.

It is well to recollect that various occupations are apt to produce injuries and eruptions of the skin, usually of an inflammatory character. The knowledge of this fact is sometimes of service to those engaged in such occupations who desire to shirk their duty or to malinger. These occupation diseases are most liable to occur in individuals predisposed to certain forms of disease of the skin ; thus, the subjects of epidermolysis bullosa and of haemophilia, even when the tendency to these conditions is not markedly developed, can with difficulty do any sort of manual work without the production of vesicles, bullae, or haemorrhages. A dock labourer who is the subject of dysidrosis or pompholyx is much more liable to septic inflammation of the hands and feet than his comrade who is free from this predisposition. Ichthyosis, eczema seborrhoeicum, and other diseases predispose all those who are affected by them, and who have to live by manual labour, to various forms of dermatitis. There are other occupations which produce dermatitis in the most healthy, such are the manufacture of bromine, iodine, the acids and alkalis, bichromate of potassium and other chemicals, the preparation of products from cinchona bark, the saturation of timber with tar or creosote. The lesions produced as the result of these occupations have frequently special features of their own in addition to those of an ordinary inflammation of the skin. In all such cases, however, the knowledge of the fact that they are liable to certain forms of disease or that the occupation in which they are engaged is apt to produce injury to the skin, is frequently utilised by individual workmen who are desirous of imposing on their employers or their doctors. In such cases it is a matter of great difficulty to determine the amount of the skin trouble produced by the patient purposely so as to receive payment without work, and what is the natural consequence of his predisposition or of his occupation.

When suspicion of the nature of a feigned eruption arises in the mind of the doctor, complete discovery usually follows soon, but some cases serve to exercise the detective skill of the most observant. If the medical attendant declares his opinion promptly he will incur the enmity not of the patient only, but in many cases also of the whole circle of relations and acquaintances, with the result that the doctor may see the patient no more, or will certainly have his freedom of observation and his opportunity of detecting the methods used by the patient greatly curtailed. It must specially be remembered when in consultation that care should be taken to avoid sensational disclosures. The reputation of a colleague may be involved, and it not infrequently happens that the medical man who has long known the patient is the first to state that the artificial origin of the disease is impossible as "she can have no reason for doing it." The assistance of an experienced and well-trained nurse is of great value in the detection and treatment of these maladies. The diagnosis of the eruption and its cause must be made so clear before a definite statement is made that the most partial relative must admit its truth. Instances of feigned disease of this nature are numerous, and will occur in the experience of every

medical practitioner. Many of them are of peculiar psychological interest, and the history of these patients, the occurrence and discovery of their maladies, remain in the minds of those who have to deal with them when the memory of cases of more serious disease has vanished. A list of some of the literature dealing with this subject is appended.

The **treatment** of feigned skin eruptions is as a rule dictated by the diagnosis, and consists in preventing the patient from making use of the particular means of irritation employed. Success in carrying out the treatment is, however, often a matter of extreme difficulty. The ingenuity and pertinacity of the patient are pitted against the perseverance and skill of the doctor, the most watchful nurse is sometimes thrown off her guard, and the patient is able to repeat the application of the irritating material unobserved. In many cases the most minute investigation of the personal apparel, the bedding, even such articles of daily use as the handkerchiefs used by the patient may be necessary before the discovery of the irritant material is made. Difficult cases under my observation have had to be admitted to hospital in order to carry out the minute invigilation required before a successful diagnosis has been made, and I can recall some mysterious cases, in which the "sufferer" has probably outwitted the doctor.

It is noteworthy that owing to the prolonged use of certain irritants, the skin is so injured that healing of the ulcerations produced is slow and imperfect, resembling in some respects the destruction produced by the influence of *x*-rays. In these cases treatment must be prolonged, and the patience of the medical attendant is frequently tried severely. As a rule, however, treatment on general principles of protection and cleanliness, with the use of carefully selected antiseptic remedies rapidly brings about healing. The application of an impermeable and irremovable dressing for a few days is often of service in proving the diagnosis, and may be the best method of treatment.

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J. G.

# DRUG ERUPTIONS

By J. Hutchinson, F.R.C.S.

**General Considerations.**—In this matter the idiosyncrasy of the patient is of great importance. Minute doses of a drug which most people can take with impunity will in certain individuals bring out an eruption, or produce other toxic effects. Nor does perseverance in the drug always lead to immunity from these effects. Thus, in one patient quinine, even in doses as small as $\frac{1}{16}$ grain, invariably produced an erythematous or bullous eruption (Allen). This susceptibility to certain drugs, like that to toxic effects from articles of food which are quite harmless to most people (eggs, for example), may be a matter of inheritance and affect many members of one family.

It must be remembered that individual susceptibility to a drug may hold in cases in which outward applications are alone concerned. Thus, acute general erythema has been known to follow the use of a lotion of quinine (ten grains to the ounce) to the head. In the case of a lady under my observation, the application of a small belladonna plaster to the chest was shortly followed by a general cutaneous erythema, accompanied by dryness of the throat, dilatation of the pupils, and other symptoms. It has been found that the patient who is susceptible to one drug (in respect of cutaneous eruption) may present a similar susceptibility to another. This has been observed with quinine and atropine, morphine and copaiba. A patient who died from an iodide eruption had also been found to be exceedingly susceptible to small doses both of arsenic and mercury. He had defective renal power. I have said that, as a rule, the peculiar susceptibility to a drug does not wear off with the repetition of the latter; and no more striking example can be cited than a case, recorded by Hagan, in which a child for three years suffered from a papular or erythematous eruption which desquamated. It was ultimately discovered that this was solely due to quinine administered from time to time by the mother, the rash ceasing shortly after the cause was stopped.

It will be convenient here to tabulate the various forms of eruption which may be produced by drugs, omitting some which are of extreme rarity. Under each heading the most common are mentioned first:—

1. **Erythema** (sometimes papular in part) may be produced by—
   *Antipyrin* (and less commonly by other drugs of the same group, such as *chloralamide, phenacetin*).
   *Animal serums* (*vide* p. 113).
   *Copaiba, cubebs*, and other similar drugs, such as *turpentine*.
   *Belladonna and atropine*.
   *Quinine*.

*Salicylic acid and salicylate of sodium.* *Chloroform* (by inhalation).
*Boracic acid, iodoform, carbolic acid,* and other irritating antiseptics—by local application and absorption through a wound surface or through the unbroken skin.

**2. Urticaria—**

| | |
|---|---|
| *Quinine.* | *Santonin.* |
| *Copaiba.* | Certain *mineral waters.* |
| *Turpentine.* | *Salicylate of Sodium.* |
| *Valerian.* | *Benzoic, salicylic,* and *tannic acids.* |

3. An **erysipelatoid eruption** (erythema with infiltration or oedema of the skin).
*Iodide and bromide of potassium, sodium,* etc.
*Aconite, chrysarobin, oil of cade, carbolic acid,* etc., applied externally.

**4. A vesicular or bullous eruption—**
*Bromide and iodide of potassium,* etc.
*Quinine.*
*Iodoform, boracic and carbolic acids, arnica,* etc., applied externally.

**5. Herpes zoster—**
*Arsenic.*

**6. Pustular eruption—**
*Bromide and iodide of potassium, sodium,* etc.
*Sulphide of calcium.*
*Antimony and arsenic* (both from internal and external use).
Rarely *nitric acid* and *salicylic acid.*
*Rhubarb.*

**7. Purpura—**
*Chlorate of potassium, iodide of potassium.*
*Chloral hydrate, chloroform, copaiba.*

**8. Pigmentation of the skin—**
*Nitrate of Silver* (p. 556). *Arsenic.* (Pigmentation probably permanent.)
*Antifebrin, antipyrin* (temporary staining only).

**9. Epidermic thickening** (keratosis) or warty growth.
*Arsenic* } both from long-continued administration. Squamous-celled
*Borax* } carcinoma may follow arsenical keratosis.

It will be noticed that in several instances the same drug is responsible for several kinds of eruption, and with regard to the first three forms (erythema, urticaria, and the erysipelatoid eruption) no sharp lines can be drawn. Again, an erythema due to a given drug, to copaiba, for example, may (if the administration of the latter be persisted in) pass into a purpuric eruption. Vasomotor paralysis of the skin is produced in either case, and its severity and acuteness will chiefly determine whether an evanescent erythema, a vesicular eruption, or even an intense purpura is induced. It is frequent for a drug erythema to be in part papular; and

in many cases from scratching, and infection, a vesicular eruption may become pustular or eczematous. Nevertheless, the enumeration and rough classification of drug eruptions, as given above, are of use; and with regard to three, at least, of the forms of skin eruption named, if due to drugs they can only be due to certain definite ones. Thus arsenic alone amongst drugs is capable of bringing on an attack of herpes zoster; only arsenic and nitrate of silver can cause permanent pigmentation of the skin, and the epidermic thickening and warty growth known as keratosis is never due to drugs other than arsenic and (much more rarely and to a slighter degree) borax.

**The Mode of Production.**—Whilst still in the dark about many points, and especially as to the problem of individual susceptibility, we may safely affirm certain principles with regard to drug eruptions. A broad division may be made into (i) those due to the direct action of the drug on the skin by absorption from outside (for example, iodoform or chrysarobin eruptions); (ii) those due to a similar direct action, the drug being brought to the affected region of the skin through the blood (for example, acne and bullous eruptions from taking iodides and bromides); and (iii) those produced, in all probability, through the central nervous or vasomotor system. It may be noted that occasionally the eruption is a mixed one, and produced in two of the above methods. Of the very large class included under (iii), we may note that the resulting eruption, although due to any one of a host of different drugs, is roughly of one type—an erythema or erythema-urticaria which is in the main symmetrical. Whether the active poison be the drug itself (more or less altered by digestion), or, as suggested by Behrend, some toxin produced during its absorption and excretion, we do not know; but the fact that the various serums, hydatid fluid, and many other organic compounds may lead to similar eruptions, is in favour of Behrend's view.

*Class I.* Eruptions due to the irritant effects of medicinal application to the unbroken surface of the skin, or to wounds, ulcers, and the like.—These are mostly of the erythematous or vesicular type, they tend to become eczematous, usually cause much itching or irritation, and (although they may spread very widely) have their greatest intensity round the part to which the medicament is applied. Examples are most common from the use of antiseptics in surgical practice. Of these, perhaps the most irritating is salicylic acid; perchloride of mercury is almost as bad, and carbolic gauze and iodoform disagree most markedly with certain skins. Bicyanide of mercury and zinc, as used to impregnate gauze and wool, is certainly of all the efficient antiseptics the least liable to cause irritation. Boracic acid is also very safe—but in certain individuals either it or the bicyanide may cause a severe erythema, or other eruption. Regions in which the skin is thin or delicate, such as the scrotum and neck, are particularly apt to inflame if exposed to these irritating antiseptics, and the greatest care has to be exercised in their use on children. Ointments containing mercurial salts, iodoform, and so forth,

may readily produce spreading erythema; and a host of other medicinal substances apt to irritate the skin might be named. Chrysarobin or chrysophanic acid (often used in the treatment of ringworm or psoriasis) and tincture of arnica are noteworthy for the erysipelas-like eruption which they may produce. Both ammonio-chloride of mercury and sulphur, if employed in strong preparations, may cause eczema, or a pustular dermatitis; and this list might be extended almost indefinitely. Very much depends on the strength of the preparation employed, and on the vehicle with which it is used.

It is impracticable to distinguish the different varieties of dermatitis produced by this class of external medicaments; it is important to remember, however, that individual idiosyncrasy plays a large part, that the effects may reach far beyond the immediate area exposed to the drug, and that erythematous, vesicular, or occasionally papular lesions are present in the great majority. Absorption through the skin accounts both for the appearance of the eruption at a distance from the main patch, and for the presence of general toxic symptoms at the same time (for example, vomiting or morbid changes in the urine). In several cases of dermatitis, due to the local use of iodoform, the presence of iodine in the urine or saliva has been proved; with mercurial eruptions the same holds true with regard to mercurial salts.

Although, perhaps, not coming strictly under the head of medicinal eruptions, it is worthy of note that many cases of erythema and allied skin lesions are due to the action of chemical substances in the air, or other conditions, of workshops; and that persons engaged in certain occupations are particularly liable to dermatitis from handling substances used therein. The following examples will suffice: French-polishers and others having to do with bichromate of potassium are liable to severe pustular or gangrenous eruptions; vanilla-workers sometimes manifest lichen-erythema of the face and hands (12); and the aniline dyes, turpentine, tar, creosote, and a large number of other substances employed in manufactures, are frequently responsible for eczema, erythema, and other eruptions (*vide* p. 80). Workers in the last-named chemicals, especially in tar, may shew cutaneous nodules particularly on the exposed parts of the limbs. This "tar molluscum" may become carcinomatous (*vide* pp. 87, 591).

*Class II.* Eruptions due to certain drugs carried in the blood acting directly on the skin or its appendages.—Of these the best examples are perhaps the confluent pustular or bullous eruptions due to the iodides and bromides. In the fluid obtained from the individual lesion the salts named have been proved to exist; and the inference is strong that the eruption is due mainly to the excretory organs of the skin being specially concerned in their elimination, and being exposed, so to speak, to a concentrated solution of the irritant. It is curious that we cannot with certainty extend the list of drugs, causing dermatitis in this manner, much beyond iodides and bromides; and noteworthy, as Radcliffe Crocker observed, that "whilst there are

many forms of eruption due to drugs, only two, iodine and bromine and their salts, are capable of exciting lesions which are special and peculiar" (2). There can be little doubt, however, that arsenical keratosis is due to a direct action on the epithelial layers by the drug; or that purpura due to chlorate of potassium is caused by the direct action of some poison (either the drug itself or a modification of it from changes in digestion) on the capillary walls. The following drawing (Fig. 10) illustrates a mild case of eruption due to iodide of potassium (mild because the cause was early recognised and removed) under my care at the London Hospital. The raised circular patches studded with yellowish points are seen on the face, and there were a few similar lesions on the trunk. Had the use of the drug been continued no doubt the eruption would have appeared on many other parts. The limbs are frequently affected.

*Iodide of potassium* has the distinction of occasionally producing a peculiar skin eruption which is, or appears at one stage to be, bullous in character (hydroa). In some cases the lesions are true bullae, in others (probably the majority) the elevations are semi-solid or even papillomatous. They have been compared to condyloma, to exaggerated molluscum contagiosum, or to mycosis fungoides. There may be a curious umbilication of each individual projection, just as is seen in molluscum contagiosum. Although the larger lesions may resemble those of mycosis fungoides, it should be noted that there is no preceding chronic dermatitis in iodide eruption. It is undoubtedly rare, but of great importance, since it is apt to cause grave errors in diagnosis. It may be met with at all ages, many cases having been observed in infants or young children; and some of the most severe cases have followed the administration of quite small doses of the drug. On any part of the body (especially the face, and those regions exposed to pressure, such as the buttocks) the eruption may appear as large vesicular swellings with conjested bases; or as a collection of yellowish-white points in an inflamed elevation of the skin. The surrounding skin may, however, be perfectly healthy in appearance. It often happens that the apparent vesicles or bullae when pricked are found to contain only a small quantity of viscid semi-purulent fluid, being mainly occupied by granulation tissue. Ulceration and scabbing may take place, but the amount of discharge will probably here again be disproportionate to the size of the swelling. Sometimes, however, the eruption is frankly bullous in character, and several observers have proved by chemical tests the presence of iodine in the contained fluid. When the vesicles are insignificant, or absent, the fleshy rounded lumps may suggest multiple gumma or sarcoma ("iodide sarcoma"); and the former point is of particular interest, since it may lead the physician to push the very drug that is responsible for the mischief. Should this error be unfortunately made, there is hardly any limit to the size which the individual lesions may attain; and there is no doubt that the profound cachexia produced has more than once led to a fatal issue. Great sloughy sores may form, which confirm the erroneous interpretation of the original tumours as gummatous.

FIG. 10.—Scattered raised nodular lesions on the face caused by iodide of potassium. Each nodule was studded with yellow points from which a thick puriform fluid could be extracted. The right lower eyelid was affected with an eczematous ulcer, also due to the drug which had been given in five-grain doses only. The eruption quickly disappeared on the discontinuance of the iodide

Bromide and iodide eruptions may occur only on certain defined regions of the skin, of which the face and neck form the most favourite one. In the New Sydenham Society's plate of hydroa from iodide of potassium, the vesicles occur in hundreds on the forearms, hands, face, and neck, but cease abruptly at the level of the clavicles.

Iodide of potassium has sometimes a remarkable effect upon the secretory glands of the skin and mucous membranes, witness the profuse coryza and secretion of pharyngeal mucus in those with whom the drug disagrees; profuse leucorrhoea has also been observed as a symptom.

No doubt many of the cutaneous lesions of iodide poisoning (furuncular or bullous) are due primarily to irritation of the sebaceous and sudoriparous glands, the transformation into skin abscesses being due to the invasion of the ever-present cutaneous micro-organisms. I have seen many cases of cutaneous abscesses in the axillae (in which region occur the largest skin glands in the body) in patients under treatment by iodides, and one of suppurative mastitis (in a male), occurring at the same time that axillary furuncles developed. Amongst the other forms of iodide eruptions may be mentioned purpura[1] and a nodular variety. Both bromide and iodide of potassium often produce a pustular acne affecting the ordinary sites of that disease—the face, neck, and shoulders. It is by no means easy to distinguish between the eruptions due to either of these two drugs, and in some cases it is probably impossible to do so by an inspection alone. Bromides, however, very rarely cause a true bullous form.

It should be noted that bromides and iodides are not infrequently prescribed together. With regard to the many forms in which iodine is given as a drug, there is good reason to believe that iodide of potassium is the most likely to cause skin eruptions as it is the most apt to disagree in other ways. But even fatal cases of eruption from iodide of ammonium have been recorded (McGuire). Apparently the new preparations of iodine (iodipin, iodoglidine, etc.) are not quite so prone to disagree as the iodides.

*Bromide Eruptions.*—The prevalent sites of these have already been mentioned; it may be noted also that the margin of the nostril and the eyelids are often affected, sometimes the hairy scalp also. The individual lesions are in the main pustular, and, if confluent, may form large rounded patches which tend to become covered with crusts and to ulcerate. They are usually slightly soft to the touch, well raised, and at first studded with little yellow points. The names "molluscoid acne" and "anthracoid eruption" have been applied to these, and are fairly expressive. Histological examination (R. Crocker, Neumann, S. Mackenzie, C. Fox) has shewn that the glands immediately around the hair bulbs are the chief sites, though not the only ones, for the cellular infiltration around them goes on to the production of small abscesses and granulation tissue. The stratum corneum separates readily, producing vesicles and pustules immediately beneath it.

[1] Very severe and ultimately fatal in a case recorded by the late Sir S. Mackenzie (*vide* Vol. V. p. 860).

It is noteworthy that in several cases of bromide eruption scar tissue has been especially attacked; for example, the scars left by vaccination on the arms.

Sometimes bromide of potassium causes either a diffuse erythema of the skin or a circumscribed form attended with infiltration, and somewhat suggestive of erythema nodosum.

*To recapitulate*: bromides or iodides may produce the following skin eruptions: (i) a simple acne (especially in persons with a natural tendency to that complaint); (ii) a patchy erythema with infiltration of the cutis; (iii) a true bullous eruption or hydroa; (iv) confluent furuncular lesions which may appear at first to be bullous; and (v) nodular

FIG. 11.—Eruption consisting of large bullae, on the face and limbs of an infant, due to bromide of potassium. The child was at the breast, its mother was taking the drug.

swellings in the skin, which may pass ultimately into the form just mentioned (2).

Crocker and others have pointed out that these bad effects of the drugs are especially prone to occur in patients with renal or heart disease. They may, however, be produced in persons in whom there is no evidence whatever of defective elimination, and in those in whom the true cause is especially apt to be overlooked. Thus, a copious bromide eruption appeared in an infant (Fig. 11) who was taking no medicine except that conveyed through the medium of its mother's milk (the woman having been for a long time under treatment for epilepsy). Again, "Clarke's Blood Mixture" has been responsible for many cases of iodide eruption. There is good reason to believe that the addition of small doses of liquor arsenicalis to a solution of bromide or of iodide of potassium tends to check the development of skin eruptions due to either of these drugs.

*Arsenic.*—We have to distinguish between (i) an acute form of dermatitis due to this drug, occurring very soon after its first administration, or due to a rapid increase in the dose given; (ii) wholly different lesions produced by long courses of arsenic; whilst (iii) the effects of local arsenical poisoning by absorption from the skin are important and frequent enough to require special notice.

(i) Under the first heading comes an erythema (with or without oedema), affecting especially the face and eyelids, and strongly suggesting erysipelas. In a case of psoriasis, for instance, let liquor arsenicalis be given for the first time, and within a day or two an acute dermatitis may appear on the face, neck, and other parts. There is great congestion of the conjunctivae, swelling of the eyelids, and a burning or itching sensation in all the affected parts of the skin. The cervical lymphatic glands may be somewhat swollen, and there are usually digestive disturbance and gastrodynia. As subsidence of the erythema takes place some desquamation usually occurs, or eczematous excoriations may be found. There is nothing distinctive of arsenic in these effects. A similar acute erythema and oedema of the face have been observed after the use of a great many drugs, some merely applied externally. Thus atropine drops have been known to bring it on; and tincture of arnica, in former days when it was a favourite application for bruises, was a frequent cause of very severe facial erythema.

The internal use of arsenic may lead to several forms of bullous or vesicular eruptions.

(*a*) It may bring on an attack of herpes zoster. Although for a long time disputed by some authors, this sequence is now generally admitted (19). The herpes may arise in the distribution of a spinal or cranial sensory nerve; but in either case exactly resembles in appearance and course the ordinary herpes zoster, and, like it, may occasionally take on an ulcerating or gangrenous process. It is probable that in all these cases a definite neuritis is produced by the arsenic. This inference is borne out by the extraordinary prevalence of neuritis in the epidemic of arsenical poisoning due to beer which occurred in Manchester and the Midlands in 1900, and also by the large number of cases of optic atrophy caused by arsenical injections, in the form of atoxyl, administered in the treatment of syphilis and of sleeping sickness.

(*b*) Multiple vesicles may appear on the hands and feet, not distributed according to nerve-distribution, but determined mainly by the delicacy and moisture of the parts of the skin affected (for example, the digital clefts). Groups of vesicles may also break out on the arms, scrotum, and other parts; and both herpes labialis and preputialis are stated to be due occasionally to this drug.

(*c*) Large bullae are sometimes seen, usually in association with severe arsenical erythema.

(ii) Skin affections, the result of long-continued courses of arsenic.

(*a*) Arsenical keratosis.—This disease is a most interesting proof of the effect of the drug upon the nutrition of the skin, and particularly that

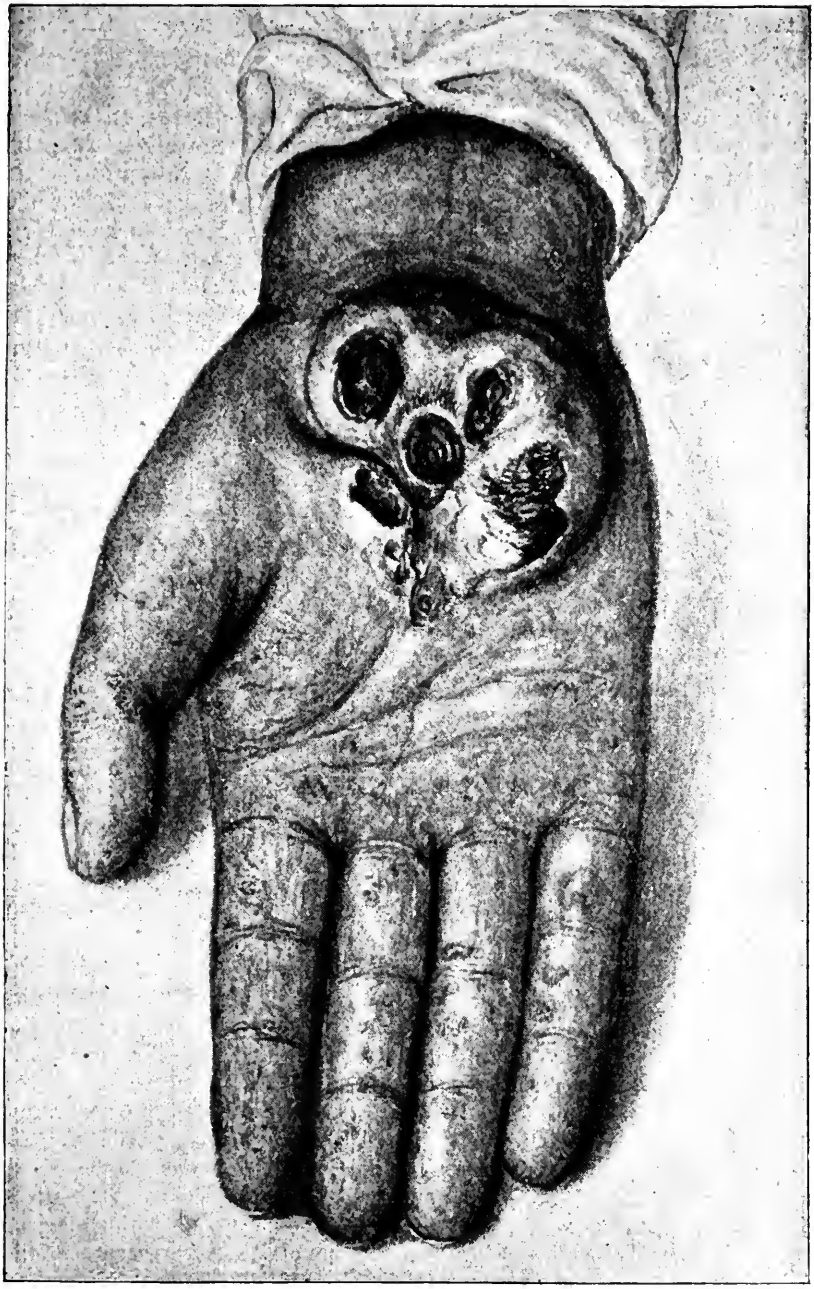

FIG. 12.—Illustration of arsenical keratosis and supervening squamous-celled carcinoma. The patient had taken arsenic for many years. The hands (both palmar and dorsal aspects) became hard, dry, and studded with fissures and small warty growths and callosities. Ultimately squamous-celled carcinoma supervened on both hands.

of its epidermic layer. The hands and feet on both aspects are the favourite regions to be affected; little callosities or hard dry warts forming here and there, whilst the intervening patches of skin are abnormally dry, rough, and leathery. The normal fissures on the palms may be exaggerated and even ulcerated. There is a quite peculiar spotted appearance of the finger-tips, the spots being dark brown or black in a rough dry skin. The knuckles often shew the largest callosities, and on similar areas over larger joints (such as the extensor surfaces of the elbows and knees) tough scaling patches of considerable extent may form, which very strongly resemble psoriasis. Their chief difference consists in the absence of that profuse peeling-off of epidermic flakes which is so common in psoriasis. The keratosis due to arsenic, and the epithelial cancer which may supervene on it, are shewn in the accompanying illustration (Fig. 12). To these peculiar effects of arsenic attention was first drawn by Sir Erasmus Wilson and Sir J. Hutchinson. It is of great interest to compare arsenical keratosis and arsenical cancer with somewhat similar changes produced by exposure to *x*-rays or even to the ordinary sun-rays in certain individuals (Kaposi's disease).

(*b*) Redness and excessive sweating of certain parts of the body (and especially of the hands) have been noticed several times in persons under a long-continued course of arsenic.

(*c*) Pigmentation of the skin, occurring in dirty-looking mottled patches, is also an undoubted though rare result; and is of particular interest as contrasting with the brilliant clearness produced by a more moderate use of the drug both in man and some animals. Arsenical pigmentation usually occurs in persons naturally of a dark complexion, and it especially affects the neck, chest and abdomen. The colour is some shade of sepia-brown, and in cases of psoriasis which have been long submitted to arsenic it is often seen, picking out the sites of the cured eruption. Arsenical pigmentation is not found with a smooth soft skin, the surface being always dry and harsh (*vide* p. 556 and Fig. 120).

(iii) Local Application.—The effects of arsenical applications upon the skin and its appendages are too important to be passed over. Some of them are well known by personal experience to medical students, as arsenic is very often used as a preservative injection for anatomical purposes. One of the commonest results in those engaged in dissecting bodies preserved with arsenic is congestion and extreme tenderness of the nail bed of the digits. Sometimes this goes on to ulceration around the nails, with perhaps shedding of the latter. Another form of arsenical irritation occurs as a vesicular dermatitis or eczema, especially affecting the delicate skin at the sides of the digits, and by its appearance suggesting scabies. Here again, if the exposure to the irritant is persisted in, troublesome ulcers may form. Similar effects are seen in workmen exposed to the use of arsenical pigment or powders in their employment, as in sheep-washing; and occasionally definite sloughing occurs from handling hides which have been prepared with strong arsenical compounds. I have seen such a case (sloughing

of the upper eyelid), which was at first supposed to be malignant pustule, in a workman who was engaged in "curing" horse-hides. It is important to remember that arsenical eczema, erythema, or even bullous eruptions have been proved to result from living in a room hung with a wall-paper charged with arsenical pigments. Naturally the local effects of arsenical applications are most severe where the skin is thin and delicate, as in young children; or in certain parts of the body in adults (for example, the eyelids, as in the case just mentioned, or the genital regions). In Brighton, in 1878, no less than twenty-nine infants and children were attacked with erythema, ulceration, or gangrene of the skin, from the use of a dusting powder containing 50 per cent of white arsenic. Thirteen of these cases proved fatal; and many instances of death from absorption in adults have occurred after application of strong arsenical preparations to cancerous sores, and the like. Arsenic is used in the manufacture of such a host of articles, such as wall-paper, hat-linings, and so forth, and is so often used to fix aniline or other dyes, that it is necessary for the physician constantly to bear the drug in mind as a possible cause of the most varied forms of dermatitis. In the last few years an extraordinary case has been reported from America. One after another the members of a family (chiefly children) died from arsenical poisoning—skin eruptions, etc. The only survivor, the mother, was for long in prison under the charge of having poisoned them. Fortunately, after three years, it was discovered that the hair mattress on which the victims had slept was impregnated freely with arsenical powder.

Treatment.—It is of the first importance, whether the skin lesions result from internal administration or exposure to arsenical vapour or powder, to remove the cause. This done, in the acute cases the use of lead lotion or subacetate of lead ointment will hasten the cure. In the chronic cases of arsenical keratosis, salicylic acid (in plaster or collodion preparation), followed by friction with pumice stone or sand soap, will soften and remove the horny patches. The danger of carcinoma supervening on the keratosis should emphasise the necessity of leaving off the drug. In the case of vesicular or pustular eruptions, and of ulceration from local exposure, careful protection of the part with some mild antiseptic dressing is of importance, and sometimes the ulcers are very slow indeed to heal. Complete change of air is advisable in these obstinate cases.

*Eruptions due to Copaiba, Cubebs, or other Balsamic Drugs.*—A very severe case is like no other skin eruption. The large deep-red patches —purpuric especially on the legs and feet, and yet attended with much more erythema than true purpura,—the itching and burning pain which accompany it, and the marked local heat, together with the special localisation, form a group of symptoms which belong to no other malady.

It cannot, however, be said that every case conforms to rule, either as regards the part affected or as to the severity of the disease; thus, for instance, there may be hardly any pain or itching.

Sometimes the face and neck are covered with the eruption, in

other cases they escape entirely. The fronts of the thighs, the ankles, and lower thirds of the legs, the region of each olecranon and the forearms (especially about the wrists), are the parts most often affected, and those in which the most pronounced patches occur.

The type of the eruption is a confluent erythema, the individual patches of which may be very large, and their colour a vivid red, sometimes compared to that of a boiled lobster. But usually there is a purplish tint, especially towards the centre of the patches, and this in the lower limbs may deepen even to a purplish black.

All the toes, the skin over the extensor tendons at the ankle, that along the tendo Achillis, and over the two malleoli, may be of a deep purplish-red.

Here and there, standing out from these patches, minute white elevations may be seen, which are really pustules, as proved by pricking them. If left alone, they dry up and rarely attain any considerable size; indeed, they would be easily overlooked. They are most common on the trunk. The copaiba erythema is usually somewhat raised, and may often be papular in parts. When very deep in colour there is probably always some escape of blood from the capillaries, and it may indeed be definitely purpuric. Vesicular and bullous forms have occasionally been met with. Fortunately the erythema is so striking, and attended with so much discomfort, that the cause is promptly detected and removed in the early stages of the eruption.

The administration of cubebs may produce an eruption almost identical with that caused by copaiba, with the same tendency to affect the hands and ankles. It is, however, much rarer than the form due to copaiba.

Turpentine also may have the same result; but oil of sandal wood very rarely causes even a slight erythema. Hence it is by far the safest of the three balsamic remedies given for gonorrhoea, besides having the advantage of being usually well tolerated in reasonable doses by the stomach. It must not be supposed that the first doses of copaiba or cubebs bring out the eruption in susceptible persons, for one often finds it produced only after the patient has taken the drug steadily for some few weeks. The varieties of the copaiba or balsamic eruption are not many, and the type is so well defined that any physician who has seen one case will probably have little difficulty in recognising a second example. Occasionally the eruption is rather urticarial than simply erythematous; and in a few cases the occurrence of bullae has been noticed.

In spite of what has just been said it must be admitted that errors of diagnosis are not uncommon. The balsamic eruption may be mistaken for measles, scarlet fever, secondary syphilis, and so on. The soreness of the throat and febrile reaction attending severe cases may favour the suggestion of scarlet fever; on the other hand, a patient with copaiba rash may very possibly have an indurated chancre at the same time. In fact, I have known cases in which a secondary syphilide and a balsamic eruption coexisted on the same patient.

Complications.—There are generally decided febrile reaction, nausea, thirst, and a feeling of general depression; if the temperature be taken it will be found slightly raised, especially at night-time. The throat may escape, but general erythema of the palate and fauces is not very infrequent. If the eruption is severe on the face there may be conjunctival congestion, or slight oedema of the lids. The tongue is often furred, and there is other evidence of gastro-intestinal disturbance. Those lymphatic glands which drain the areas most affected are commonly enlarged, though I have never known the patient draw attention to this symptom.

The urine of a patient with a copaiba rash may present peculiar features: (*a*) a peculiar balsamic odour, especially noticed on evaporating it down; (*b*) a cloudy opacity on floating the urine on nitric acid (this is of obvious importance in connexion with the diagnosis from scarlet fever); and (*c*) a temporary lilac colour when nitric acid is dropped slowly into a thin layer of the urine. None of these reactions, however, is constant, and certainly in many cases nothing abnormal is to be noticed in the urine. The colour indicated (which is sometimes a deep blood-red) may be best obtained by floating the urine on nitric acid and allowing it to stand, when perhaps for days the supernatant urine will retain the peculiar hue.

Having now considered three of the most important groups of drugs apt to produce skin disease, I can but briefly allude to a few of the remainder.

*Chloral.*—The eruption due to this drug may be taken as fairly typical of a large class of cases due probably to some poisonous action on the vasomotor system. A transitory, patchy erythema, bright pink to red-brown in colour, confluent in parts such as the face, roughly or exactly symmetrical, subsiding without leaving any trace behind,—such are the chief features of the chloral eruption (see Fig. 13). The mucous membranes are often affected as well as the skin, the throat being congested and painful; and there may be distinct febrile reaction. Papules, pustules, or vesicles are but rarely met with; occasionally there is distinct exudation into the skin, which may be haemorrhagic.

*Mercury* taken internally may produce similar effects, but there is perhaps more tendency for the eruption to become eczematous. However, an eruption caused directly by the internal use of mercury is rare, although those due to its external use are fairly common.

*Opium* and its alkaloids (especially *morphine*) may cause very similar eruptions to those produced by chloral; the same may be said of *antipyrin* and its allies. Rashes due to antipyrin are of common occurrence; they consist mainly in a symmetrical erythema on the chest, abdomen, and back, attended with itching and free perspiration, and occasionally followed after a few days by desquamation. Papular, urticarial, or purpuric forms may be met with. Care is required in the diagnosis of the erythema from either measles or scarlet fever; the antipyrin rash is of a brighter colour than the former, of a more diffuse

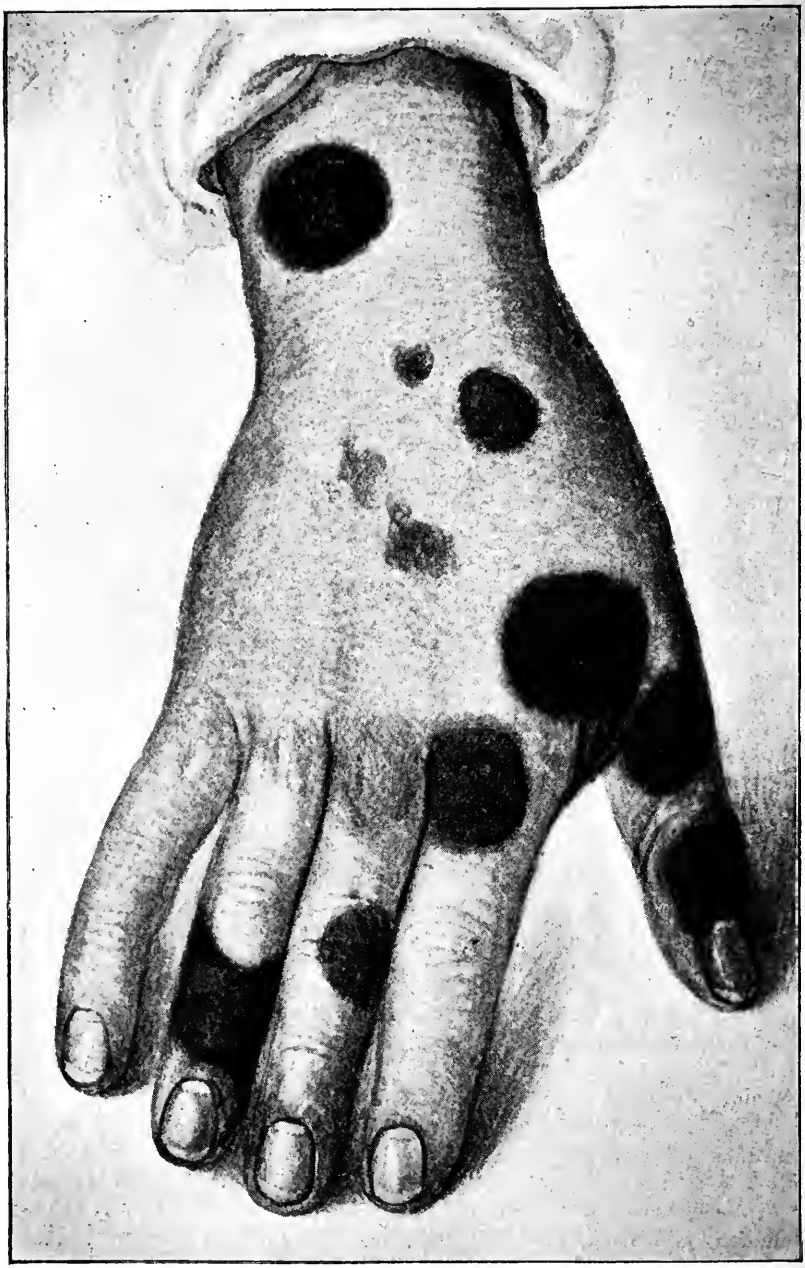

FIG. 13.—Rounded patches of deep erythema with small vesicles, due to the internal use of chloral hydrate. The eruption was symmetrical.

form than the latter, and is not accompanied by marked fever or throat-lesions.

*Quinine.*—If quinine causes a cutaneous eruption, the latter is usually of a patchy, erythematous nature, or urticarial; occasionally scarlatiniform, or bullous and eczematous. It may affect the whole body, but is more often restricted to certain regions such as the head and neck, or both lower limbs. In one case (20) a purpuric erythema appeared on the inner aspect of the thighs and on the abdomen; months later a single five-grain dose of quinine brought out a repetition of the eruption in the same regions.

**Diagnosis.**—The majority of drug eruptions take the form of an erythema or urticaria, or a mixture of the two. In some cases the suspicion of scarlet fever arises, and the possibility of an erroneous diagnosis is favoured by the fact that the eruption may ultimately desquamate, its appearance may be attended with soreness of the throat, and (when due to copaiba, turpentine, etc.) the patient's urine, if floated on nitric acid, may give a reaction suggesting the presence of albumin; this precipitate can be distinguished from protein by its solubility in alcohol (*vide* Vol. IV. Part I. p. 559). But it is quite exceptional for any drug eruption to be attended with such a rise of general temperature as would be expected in the case of scarlet fever. Measles may be closely simulated by certain drug eruptions. It must be remembered that the patient himself rarely suspects the cause, and sometimes only careful cross-examination will elicit the truth.

The important question of diagnosis of the special eruptions due to iodides and arsenic has been already alluded to. By a singular and unfortunate coincidence the effect of iodides (for example, the tuberose lumps on the skin) may resemble tertiary syphilis, for which it would be the cure; in the same way arsenical keratosis is not unlike psoriasis, for which it would be prescribed.

**Treatment.**—Of course it is most important to make a correct diagnosis, and to stop the administration of the offending drug immediately. As a general rule, when the cause is removed the effects quickly come to an end, but this is not invariably the case; for instance, eruptions due to quinine or bromide of potassium may persist several weeks after the complete discontinuance of the drug. Indeed many observers have seen fresh crops of bullae, etc., appear for some days after the supply has been cut off.

Sometimes a change in the method of administration may be followed by cessation of the bad effects, if it be very desirable that the drug should be persisted in. Thus in the case of such drugs as arsenic or iodide of potassium free dilution may prevent toxic effects. The very frequent cases of the copaiba eruption are undoubtedly due in part to the reckless way in which large doses are taken at short intervals by patients with gonorrhoea. Any drug apt to cause gastric or cutaneous disturbance is best taken on a full rather than on an empty

stomach. The statement that to increase the doses of a drug will sometimes succeed in overcoming the liability to toxic effects of an individual rests on a slender foundation. As a rule, doubling the dose merely doubles the bad effect. Individual susceptibility here is so important that of many people it is true that no dose, large or small, of a drug that has ever been proved to irritate them can be taken without a similar result. In the case of a man with syphilis under my care his susceptibility to iodide of potassium was so great that a glass of Woodhall Spa Water was followed in him by the same symptoms as those produced by a considerable dose of the drug.

JONATHAN HUTCHINSON.

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J. H.

# RASHES DUE TO THE ADMINISTRATION OF ANIMAL SERUMS

By E. W. Goodall, M.D.

The subcutaneous or intravenous injection into the human subject of the serum of an animal frequently gives rise to a rash. It has been stated by more than one writer that if the serum is given by the mouth or rectum, the occurrence of a rash, or of any other of the symptoms to be mentioned later, is very exceptional. The cutaneous effect is produced whether the serum be that of a normal or of an immunised animal. The horse is the animal whose serum is most frequently employed for therapeutic purposes.

The rash produced is most often an erythema. Three common forms are urticaria, erythema marginatum, and an indefinite, blotchy erythema; less common are a morbilliform and a scarlatiniform erythema. The wheals of urticaria will appear in several places at once; they quickly disappear, leaving large blotches, which also rapidly fade. But as fresh wheals continue to come out, the rash may last from one to three days. There is usually itching, which may be almost intolerable. Erythema marginatum often affects the extremities only, and especially their extensor surfaces; but it is not at all unusual to see the skin universally involved. The rash begins in small pink or crimson macules and papules. These in the course of a day or two increase in size and coalesce; but as they grow larger they fade in the centre, where the skin assumes a somewhat bluish tinge. When at its height this lesion presents the festooned or "map-like" appearance of erythema marginatum or gyratum. Sometimes the edge of the patch is raised, but usually it is not. Gradually the erythema fades, leaving, it may be, a slight brownish staining which does not disappear for some days. This form of serum rash may last as long as a week. A less common, but not rare, form of rash is an erythema consisting of large irregular-shaped blotches, which fade away at their periphery into the surrounding skin. They are much like the blotches left by the vanishing wheals of urticaria, but no wheals are seen to precede them. The morbilliform erythema begins in the same way as the marginate variety. It also affects mostly the limbs, but may invade equally the whole skin. At first there are discrete papules and macules; but these coalesce to form large blotches, and the whole appearance of the rash is very like that of measles. The patches do not clear up in the centre as they spread. When they fade they fade as a whole. This form of rash may last for several days. Both the marginate and the morbilliform rashes may become so confluent as to lose their original appearance, and the skin then presents a more or less uniform redness in which the original lesions can here and there be traced. Moderate injection of the

conjunctivae is sometimes present with these rashes. In my experience the scarlatiniform variety is rare; a diffuse, more or less punctate erythema, resembling that of scarlet fever, covers the trunk and often the limbs also. It comes out fairly quickly all over and persists for from one to three days. In very rare cases the serum rash is haemorrhagic; usually the haemorrhages are petechial and accompany an erythema. But cases have occurred in which they have consisted of purpuric spots three or four lines in diameter. In extremely rare instances, the erythema, usually of the morbilliform variety, is accompanied by vesicles or bullae. Sometimes the erythematous rashes described above make their appearance first at or in the neighbourhood of the site of injection, though this is far from being of constant occurrence. Occasionally the rash is strictly limited to the region mentioned, in which case it may take the form of a uniform blush.

In many cases the rash is accompanied by pyrexia, usually of moderate degree, though a height of 104° F. may be reached. With this pyrexia there are the usual symptoms of a slight febrile attack. Fever is met with less frequently with urticaria than with any other form of rash. The fever usually lasts as long as the rash is out.

In a few cases the patient complains of pain in some of the joints during the time the rash is out. The joints most frequently affected are the large ones,—shoulders, hips, knees, and elbows; but in one case or another I have seen nearly every joint in the body affected. Though the pain may be so acute that the patient cannot bear the slightest movement of the joint, there is very rarely swelling or redness. Occasionally the pains seem to be in the tissues around rather than in the joints. The pain may persist for several days. There is always pyrexia. I have never known suppuration to follow.

In a few cases there is moderate lymphadenitis, usually of the cervical glands, at or soon after the appearance of the rash. The inflammation of the glands subsides as the rash fades. Slight albuminuria may occur when the temperature is raised. In very rare cases oedema of the scrotum has been observed; in two or three of these cases I have thought that there was testicular swelling. The joint-pains and other complications are seldom present without a rash.

When the rash is urticarial and is plentiful and intense, the skin may be swollen, and the face, especially, is puffy; but this condition is very transient. In a few cases an abscess forms at the site a few days after the injection. This is not always due to contamination of the serum or to faulty methods of injection. For in my experience such abscesses have occurred most often in patients who have been suffering from an infective disease, such as scarlet fever. The slight injury caused by the injection appears to determine the local suppuration.

The group of symptoms mentioned above, except the abscess, constitutes what is known as the "serum disease." There is in the majority of cases an interval of several days between the injection of the serum and the onset of any of the symptoms of the serum disease. The duration of the

interval is commonly nine or ten days; but it may be as short as three or four or even less, or as long as twenty-one or more. Urticaria often comes out on the sixth or seventh day, the other forms of erythema with joint-pains on the ninth to the fourteenth day.

In exceptional cases a single injection of serum may be followed by two or three distinct rashes. If one of the rashes is urticaria, as it usually is, the urticaria invariably comes out first, to disappear and be followed, after an interval of two or three days, by the other erythema, perhaps accompanied by pains in the joints. Sometimes both rashes are urticarial.

It is suggested that the occurrence of two or three rashes after one injection may be due to the practice that obtains in most laboratories of mixing the serums of several horses in order to produce a serum of a certain antitoxic value. It is undoubtedly true that different specimens of serum possess different capabilities of producing the serum disease. One serum will produce hardly any effects of this kind at all, whereas another will give rise to a rash and fever in nearly every patient who is injected. The degree of disturbance, too, varies much with different serums. Analysis of a large number of cases shews that about a third of the patients injected will have a rash, and 5 per cent pains in the joints. The serum disease follows large, as regards volume, rather than small doses of serum, and, as Dr. J. D. Rolleston has observed, mild rather than severe cases of diphtheria.

I have said above that ordinarily there is an interval of several days between the injection and the serum phenomena. But under certain conditions the duration of this period may be much shortened. One condition is that the patient shall have been injected with serum on some previous occasion, seldom less than three weeks before. In such circumstances the serum disease may make its appearance very quickly and very severely. This hastened reaction may be one of two kinds: either the rash and fever appear within a few minutes or hours of the injection, the "immediate reaction" of von Pirquet and Schick, or from one to five days after, the "accelerated reaction." The immediate reaction is the more serious of the two; the patient may have a sharp rigor, and even convulsions, with a high temperature, and there may be vomiting and collapse. The rash comes out very rapidly and extensively, and in rare cases there are symptoms resembling an attack of asthma or of acute inflammation of the larynx. The accelerated reaction is less severe than the immediate; there are rash, pyrexia, and, maybe, joint pains, and, if the reaction is severe, collapse. Besides these reactions there may be subsequently a reaction of the normal type. More than once I have known a patient to suffer from an immediate, an accelerated, and a normal reaction. The cases in which these phenomena have been observed have usually been those in which the patient has been injected for a relapse or a second attack of diphtheria, when he has been treated with serum in the first attack. But several cases have been reported in which a very severe and even fatal immediate reaction has followed a primary injection in persons who have been the subjects of asthma or some similar

affection. I have seen an immediate reaction take place after a second injection given 414 days after the first, and an accelerated reaction 1852 days after the first. Other observers have met with even longer intervals. The shortest intervals I have observed have been twenty-two days for an immediate and nineteen days for an accelerated reaction.

To these phenomena the terms anaphylaxis and supersensitisation have been applied, because the person treated is in a highly sensitive state with respect to the antigen injected, in this case serum. It is to be noted that the daily injection of a serum will not give rise to the phenomena. There must be a distinct interval of about three weeks at least between the first injection or series of injections and the second. My experience of anaphylaxis is derived entirely from the treatment of diphtheria cases at the Eastern Hospital. For several years following the introduction of the serum treatment, nearly half the patients injected a second time for a relapse or second attack of diphtheria exhibited these symptoms, so that I became chary of using the remedy in relapses and second attacks if the patient had been treated with serum in the first. But during the last six or seven years, for reasons of which I am ignorant, they have been both less frequent and less severe, as indeed have also been the ordinary cases of serum disease; so that now I seldom hesitate to employ serum for a relapse or second attack, at any rate the serum usually supplied to me, a serum which is made specially for the Asylums Board's hospitals. The causes of anaphylaxis are very obscure; indeed the subject, so far as explanation is concerned, is still in the hypothetical stage.

**Diagnosis.**—Serum rashes should seldom give rise to much trouble in diagnosis. If the rash starts from the site of injection it is in favour of serum as a cause. The absence of Koplik's spots distinguishes the rash from measles, and of a sore throat from scarlet fever. Should the rash be of the marginate variety, measles can be excluded.

**Prognosis.**—The only cases to cause anxiety are those, fortunately not common, in which the rash is part of a severe immediate reaction. Usually the serious symptoms are of short duration. I have never seen such a case fatal; but it is possible that some of the sudden deaths that have been reported as following immediately upon an injection of serum were due to supersensitisation (*vide* Vol. I. p. 1037).

**Treatment.**—Usually none is required. The urticarial rash may itch grievously; this irritation of the skin will be relieved by sponging with evaporating lotion or with tepid water slightly acidulated with acetic acid. If the rash persists calcium salts should be given. Joint-pains are relieved by the local application of lead and opium lotion, and by the internal administration of an anodyne.

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E. W. G.

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## PARASITIC DISEASES OF THE SKIN

By Sir MALCOLM MORRIS, K.C.V.O.

THE cutaneous affections caused by bacterial micro-organisms are described in other articles; this article deals solely with the diseases produced by fungi and by insects. These larger parasites, vegetable and animal, set up an irritation which manifests itself in characteristic lesions. The diseases induced by them are indefinite in duration, and give rise to little constitutional disturbance, however extensively the skin may be invaded.

### VEGETABLE PARASITES

The diseases caused by vegetable parasites are *ringworm* (including *eczema marginatum* and *tinea imbricata*), *favus*, *tinea versicolor*, *erythrasma*, *actinomycosis*, and *mycetoma*. Pinta also, the "spotted sickness" of tropical America, probably belongs to this class, though some authorities considered the parasite to be a bacillus (*vide* Vol. II. Part II. pp. 750-753). Actinomycosis attacks the skin but seldom, and then, as a rule, only secondarily (*vide* Vol. II. Part I. p. 337). The same statement holds good of mycetoma, which is caused by a closely allied fungus (*vide* Vol. II. Part II. pp. 754-759). These two affections, therefore, are dealt with elsewhere, as also is pinta.

RINGWORM.—Ringworm may attack the hairy or the glabrous parts of the skin, and in rare instances the nails and the mucous membrane. Ringworm of the hairy skin presents two natural subdivisions, according as it affects the scalp (tinea tonsurans) or the beard (tinea barbae or tinea sycosis). A rare form of ringworm, tinea palpebralis, which attacks the eyebrow and eyelashes, might be included in this category, but is generally classed with ringworm of the glabrous skin. This second subdivision comprises ringworm of the body (tinea circinata), ringworm

of the nails (onychomycosis), and ringworm of the buccal mucous membrane. In addition to these, there are forms of the affection, with special features, which occur for the most part in tropical climates, and are styled eczema marginatum and tinea imbricata. Allied to eczema marginatum, which might be more appropriately called tinea marginata, is dhobie itch (*vide* Vol. II. Part II. p. 746).

**Etiology of the Ordinary Ringworms.** — The discovery of the numerous fungi concerned in the causation of ringworm forms a singularly interesting chapter in the history of dermatology. In 1842-44 David Grüby, a Hungarian Jew, who had left Vienna on account of his religious faith, and had settled in Paris and attached himself to the Hospice des Enfants-Trouvés, followed up the memoir, published in 1841, in which he had shewn the cryptogametic nature of favus, by a series of papers reporting his discovery of three different cryptogametic fungi associated with as many forms of ringworm. In 1845 Malmsten of Stockholm published a description of a parasite which he had independently discovered in ringworm, and named it a trichophyton (*θρίξ*, hair; *φυτόν*, fungus); and later Hardy coined the word *trichophytie* (trichophytosis) for the affection caused by the parasite. Of Grüby's parasites, two were trichophytons, an endothrix, causing tinea tonsurans of the child, and an endo-ectothrix, causing ringworm of the beard; the third, with smaller spores, was the *Microsporon audouini*, the cause of microsporosis of the scalp. But, with a carelessness which at first sight seems hardly distinguishable from perversity, Grüby spoke of this third affection as porrigo decalvans, the name by which alopecia areata—the *pelade* of modern French writers, at that time only just beginning to be differentiated from the tineas—was often known, and his description of the symptoms was so bald and inexact that, with but one exception, his contemporaries failed to perceive that he was describing quite a different affection. The explanation, as Sabouraud remarks in his masterly and exhaustive treatise on *Les Teignes* (43)—the third volume of his monumental work on *Maladies du Cuir Chevelu*—is that Grüby, though a first-class mycologist, was but a mediocre dermatologist. His descriptions of the parasites he discovered and of the hairs they had ravaged are models of accuracy; and Sabouraud gracefully says that after (1892) he had rediscovered and described Grüby's microsporon, without knowing that he was not the first in the field, he found that his description of it was inferior to that which Grüby had published fifty years earlier. But Grüby's clinical descriptions were so lacking in precision—he did not even mention in this instance that he was describing an affection special to the child's scalp—that almost the only dermatologist who saw that by porrigo decalvans he meant tinea tonsurans, was Cazenave, who refused to accept the cryptogametic origin of any form of ringworm. The rest, led by Bazin, identified Grüby's porrigo decalvans with *pelade*, diligently sought the fungus in a disease with which it had nothing to do, and, when they found it in the disease of which it was the cause, took it for a trichophyton. Thus the distinctions established by Grüby between

his parasites were lost sight of, and in spite of marked clinical differences, and of differences observed in the fungus, for nearly half a century it was generally believed that in ringworm there was but one parasite concerned, causing a single disease—trichophytosis—of which the variations were explained simply by differences in the soil on which the fungus grew.

In 1891 Neebe and Furthmann, pupils of Unna, in 16 cases of ringworm succeeded in isolating four parasites which yielded four different cultures, though to what species they belonged is not known, and it has been conjectured that two of them were microsporons. In the following year, Sabouraud, at the instance of Besnier, began the brilliant investigations—clinical, microscopical, and cultural—which differentiated microsporosis and trichophytosis, and traced the latter affection to many different species or fixed varieties of trichophyton. Owing largely to this observer's epoch-making work, it is now recognised that there are two different families of ringworm fungi, the microsporons and the trichophytons, each of them comprising a number of species or varieties. His results have in the main been confirmed by the investigations of other dermatologists, both English and Continental. Sabouraud himself records that the first confirmations of the clinical and microscopic differences between microsporons and trichophytons came from England, where microsporosis is more frequent than in France. Eleven species of the ringworm microsporons have been identified, and over thirty of the trichophytons. The differences between the microsporons are slighter than those between the trichophytons, and chiefly cultural. The trichophytons differ from each other not only in their cultural characters but in their morphology, their habits, and their clinical manifestations. The individual members of any given species, however, whether of microsporons or of trichophytons, appear to vary little in virulence; the greater or less severity of the reaction depends upon the species rather than upon the individual fungus. Being destitute of chlorophyll, and unable, therefore, to absorb carbonic acid from the air, they convert substances into nutriment by elaborating diastases or soluble ferments. The reaction they excite in their parasitic life consists in a disassociation of the epidermic and hair-cells, followed by an inflammation in surrounding structures.

The mycological relationship between the microsporons and the trichophytons was insisted upon in 1896 by Dr. T. Colcott Fox. These, with a third family of dermatophytes, the achorions, the parasites of favus, are now placed by Matruchot and Dassonville among the Gymnoasceae, belonging to the order of the Ascomycetes—a grouping of which Bodin expresses a provisional approval. But the classification of the ringworm parasites and of other dermatophytes, as of fungi generally, is still far from finality; and Massee, an English authority on fungi, designates the order to which the Gymnoasceae belong the Hemiascomycetes, whilst he allocates "nearly all" the fungi that cause plant and animal diseases to the order Deuteromycetes. As to the origin of dermatophytes, there is much probability that, like the majority of

parasitic fungi, they are capable of a saprophytic existence, as was advanced in an early stage of his investigations by Sabouraud. They will grow on almost anything, and the most vigorous cultures are those yielded by decayed vegetable matter, compost, etc. Grown on favourable artificial media, they take on, even in primary cultures, intimate resemblances to the common moulds which flourish upon dead organic matters, and they develop true organs of fructification, of which in their parasitic life they are destitute. Some of them, moreover, are so rarely met with in animals as to render it improbable that they are absolutely dependent on an animal host.

One division of the ringworms is into tinea with small spores—the microsporic forms—and tinea with large spores—the trichophytic forms. It is now too late to attempt to expel the word "spores" from dermatomycotic terminology, but it must be understood that the "spores" of the parasites—that is, the short elements—are not true organs of fructification, but, like the longer elements, are mycelial in their nature. This division of the ringworms into small-spored and large-spored is the more unfortunate, since among both microsporons and trichophytons the so-called spores vary considerably in size according to the species. Those of the microsporons may be as large as 4 $\mu$, whilst those of the trichophytons may be as small as 3 $\mu$, the limits of the one being 2-4 $\mu$, and of the other 3-8 $\mu$. In 126 consecutive cases of ringworm which I investigated, Dr. Galloway, who made careful measurements of the parasitic elements, reported that in a specimen labelled "small" (microsporon) the mean of ten measurements of detached spores was 3·6 $\mu$, the extremes being 2 and 4 $\mu$; the transverse diameter of the mycelium interwoven with them varied from 2·5 to 4·5 $\mu$, giving an average of about 4 $\mu$. In a specimen labelled "large" (trichophyton) the mean of ten measurements of detached spores was 4·8 $\mu$, the extremes being 3 and 6 $\mu$; the diameter of the mycelium was about 5 $\mu$, varying from 3 to 6 $\mu$. Dr. J. C. M. Given, in a series of 50 consecutive cases—44 of the scalp, 3 of the glabrous skin, and 3 of the beard—also found that the difference in size of spore between microsporons and megalosporons (trichophytons) was not so great nor so constant as some observers had reported. This is now generally recognised, and it is emphasised by the formation of certain species of trichophytons into a small-spored group (*microïdes*) and of others into a large-spored group (*mégaspores*), the remaining species of trichophytons forming a middle group.

Clinically, therefore, the two families are differentiated less by the size of the spores than by their shape and arrangement and modes of growth. In the microsporons the spores are predominantly round or ovoid; in the trichophytons, square with rounded angles, or oblong with sharper angles. In the microsporons, again, there is no definite arrangement of the spores. They are dotted about irregularly, but everywhere the individual elements are discrete. The felting of mycelium is irregularly jointed, curved, and branching. The fungus lies around the hair, whether of the scalp or of the body, as a greyish sheath, visible macro-

# PLATE I

FIG. 1.—Infection of the hair with *Microsporon audouini*. (Colcott Fox.)

A, The fungus ramifying in the epithelium at the mouth of the follicle and encircling the hair within the follicle.

B, The hair attacked within the follicle.

C, The completely infected hair.

FIG. 2.—Infection of the hair and skin with endothrix trichophytons. (Colcott Fox.)

A, The fungus growing down the follicle around the hair.

B, The hair, with cuticle intact, is seen to be infiltrated. The fungus has disappeared from around the hair.

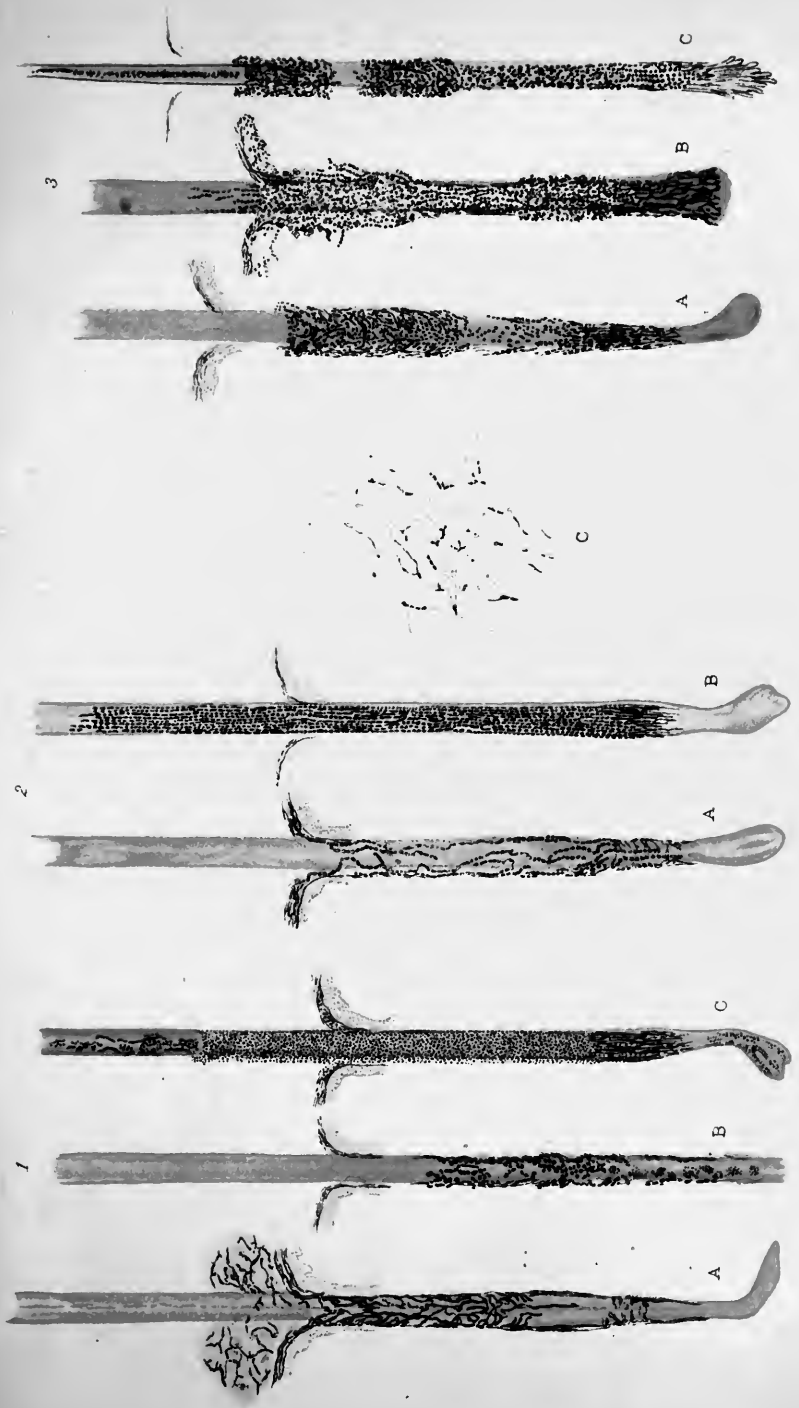
C, The fungus in the epithelial roof of a vesicle from a woman's hand.

FIG. 3.—Infection of hairs with endo-ectothrix trichophytons. (Colcott Fox.)

A, Early stage of infection shewing the fungus both in and around the hair (from an infant's scalp).

B, Hair of beard shewing the fungus within the hair entering the bulb. Both extra-pilar and intra-pilar chains are to be seen.

C, Horse's hair shewing extra-pilar and intra-pilar chains.

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scopically, eating away the hair, fraying the edges, working its way into the root. In time the hair breaks, at some distance from the follicular orifice, and the parasitic sheath becomes disintegrated, forming a patch of ash-coloured scales on the epidermis. The trichophyton, on the other hand, attacks the root first and grows upwards. The hairs are broken off short, and there is no visible sheath outside the follicular orifice. The spores, too, are arranged in regular chains, and the mycelium is short and regularly jointed. One point of resemblance between the two types of ringworm is that in both alike, as the researches of Dr. Adamson and of Drs. Fox and Blaxall have proved, the attack upon the hair is preceded by a lesion in the epidermis at the spot where the fungus settles.

In human ringworm, whilst contagion is most frequently from case to case, the disease is frequently derived from the domestic animals and other animals with which man most often comes into contact. At least a dozen of the trichophytons and four of the microsporons are common to him and to them. Among animals, the horse presents the greatest number of tineas, being liable to attack by seven trichophytons and two microsporons. Of the animal origin of many cases of human ringworm, a large body of evidence has been accumulated by Tilbury Fox, Bodin, Sabouraud, and others. Bodin's extensive series of investigations in this branch of the subject include a case of microsporosis in which the parasite, *Microsporon equinum*, was communicated to a man by a horse. It is remarkable as the only instance in which this parasite has been found in human ringworm. As English contributions to the evidence, it may be mentioned that so long ago as 1871 Tilbury Fox exhibited 7 cases of trichophytosis in man in which the contagion was derived from a pony, and that Dr. Bunch has published an interesting and conclusive series of cases of ringworm in human beings and in animals with which they had been in intimate contact. In this series the fungus was isolated from both human and animal cases, and the similarity of cultures from the two sources established (*vide* Figs. 14, 15), a comparison of the dates at which the first symptoms appeared in the two sets of cases ruling out the possibility of the lower animal having contracted the disease from the human being. In these cases both microsporosis and trichophytosis were represented. Bodin holds that the majority of the cases of adult trichophytosis are of animal origin, whilst Sabouraud is satisfied that in France at least, when the disease takes on inflammatory characters, in nine cases out of ten it is of animal origin, and that all the ringworms of adults are traceable to animals. That ringworms of animal origin, whether microsporic or trichophytic, are, as a rule, more inflammatory than the others is generally allowed.

I now proceed to deal separately with the *microsporons*. The eleven species of this family are divided by Sabouraud into two groups—(1) those of the *Microsporon audouini* type which give a slight (*petite*) or medium (*moyenne*), or, as he also styles it, a slow (*lente*) culture, and (2) those of animal origin, which yield a vigorous, rapid (*vivace*) culture. In the latter group the preparation is entirely occupied with multilocular

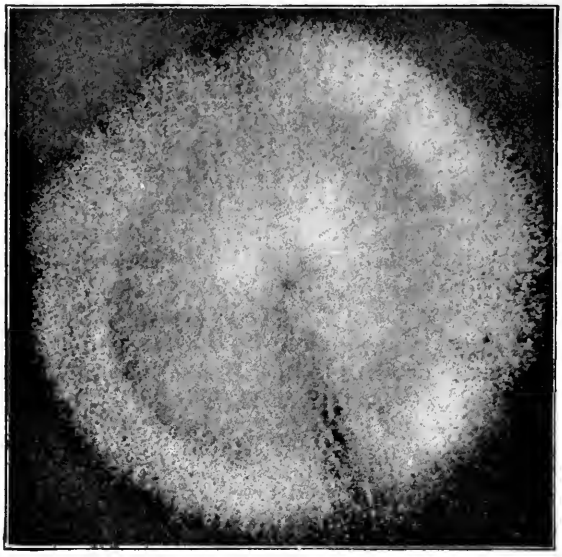

FIG. 14.—Culture of trichophyton from patient. (Bunch.)

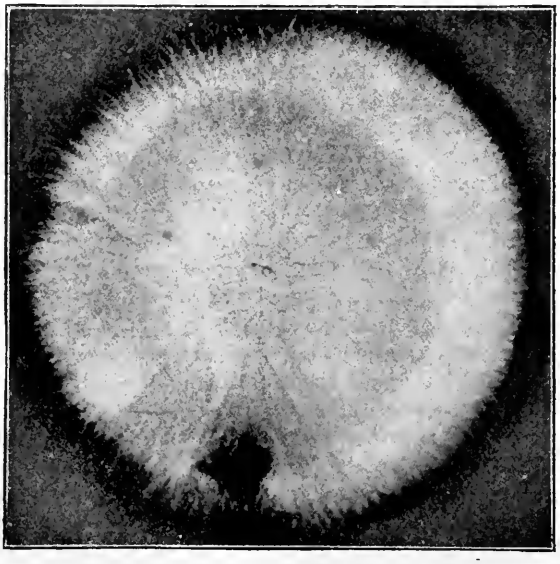

FIG. 15.—Culture of trichophyton from cat. (Bunch.)

spindles heaped together in masses (compare Figs. 16, 17). In this group, too, on a glucose or glycerin medium a white, downy pleomorphism is exhibited, quite different from the mother-culture, whilst microsporons of human origin never produce pleomorphic forms. Inoculation with a culture belonging to the second group is always positive, whereas a culture belonging to the first group is usually negative.

FIG. 16.—Adult culture of *Microsporon audouini*; × 260. (Sabouraud.)

FIG. 17.—Ten-days' culture of a microsporon vivace; × 260. (Sabouraud.)

In the following list of the microsporons those of clinical importance are italicised :—

Slight or medium, slow culture.

1. *Microsporon audouini* (Grüby, 1844; Sabouraud, 1892).
2. Microsporon umbonatum (Sabouraud, 1907).
3. *Microsporon tardum* (Sabouraud, 1909).
4. Microsporon velveticum (Sabouraud, 1907).

Vigorous, rapid (*vivace*) culture.

5. *Microsporon felineum* (Colcott Fox and Blaxall, 1896).
6. Microsporon equinum (Bodin, 1898).
7. *Microsporon canis* vel *lanosum* (Bodin, 1897; Sabouraud, 1907).
8. Microsporon fulvum (Uriburu, 1907).
9. Microsporon villosum (Minne, 1908).
10. Microsporon pubescens (Sabouraud, 1909).
11. Microsporon tomentosum (Pelagatti, 1909).

The type species is *Microsporon audouini*, which may be called the special ringworm parasite of the child, since it scarcely ever attacks adults.

It is the cause of over 90 per cent of juvenile ringworm in London. In my own series it accounted for 92 per cent of the cases; in Drs. Colcott Fox and Blaxall's series the percentage was 80 to 90; in a series of 178 consecutive cases reported by Dr. Adamson it was as high as 97. In a series of 500 cases of dermatomycoses given by Sabouraud (43), comprising the ringworms, favus, and eczema marginatum, microsporosis of the scalp figures much less largely than trichophytosis of the same region, the numbers being respectively 159 and 218. Yet a few years ago (1892-94) there was twice as much microsporosis as trichophytosis in Paris. It is not easy to see how this reversal of proportions is chiefly explained, as Sabouraud suggests, by the systematic treatment of tinea tonsurans by *x*-rays. Prevalent in the north-west of Europe generally, the *Microsporon audouini* is met with most frequently of all in England. South of the Loire it becomes rare, it is scarcely ever found in Italy or in Spain, in Denmark or in Sweden, in Germany or in Austria. On the other hand, the microsporons of animal origin seem to be of almost universal distribution.

Other microsporons which are the cause of human ringworm are *Microsporon felineum* and *Microsporon canis*, closely allied species which are responsible for an important percentage of human contagions respectively in England and in France. In Sabouraud's list, *Microsporon canis* accounts for 12 cases of scalp ringworm (besides 2 of the glabrous skin and 1 of the beard), against 132 attributed to *Microsporon audouini*. In the same list *Microsporon tardum* is responsible for 13 cases of scalp ringworm, and *Microsporon umbonatum* for 2. *Microsporon felineum*, not seldom met with in microsporosis in this country, does not figure in the French list. And of all Sabouraud's 161 cases of microsporosis, in only 3 was any region other than the scalp affected, these three exceptions being attributable, as we have seen, to *Microsporon canis*.

By animal microsporons severe inflammation is sometimes set up, and British, Danish, and German authors have reported cases in which kerion, the severest form of ringworm, has been associated with microsporons. French observers, on the other hand, appear to have met with kerion only in connexion with trichophytosis. The question is very fairly discussed by Sabouraud, and of the various hypotheses he presents for reconciling the differences between French and other observers upon this point, the most probable one is that the parasite described by the latter is really one of the small-spored trichophytons, of which the spores form a sheath around the hair as in microsporosis.

To come now to the *trichophytons*. One classification of the species of this family is into groups according to the mode in which they infect the hair. In the *endothrix* group the parasite makes its way into the hair between the cuticle-cells, and develops exclusively within the hair structure. In the *endo-ectothrix* group it not only develops within the hair, but continues to proliferate in the follicle outside. The name proposed by Sabouraud for this second group, *ectothrix*, has led to not a little confusion.

Opposed as it is to "endothrix," it has sometimes been interpreted to mean that the parasite does not find its way into the substance of the hair, but occupies the sheath only. Even so learned a dermatologist as Mibelli was misled by the term, as Louis Wickham once pointed out. Sabouraud, usually as happy in nomenclature as he is precise in definition and graphic in description, appears to be still content with this equivocal designation; but it will be better consistently to substitute for it "endo-ectothrix," though "ecto-endothrix" would be still better, since it is the surface of the hair that is first attacked. The endothrix parasites are probably of human origin, the endo-ectothrix of animal origin. This generalisation is obviously difficult of proof, but, as Sabouraud says, no one has yet found upon an animal a trichophyton which is an endothrix on man, and all the animal trichophytons found on man are endo-ectotriches.

Sabouraud divides the endothrix group into two—the true endotriches and the neo-endotriches, the prefix *neo-* referring not to a later discovery of the parasites, but to the prolongation of the invasion of the hair—of the early stage of the attack (*stade de jeunesse*). Whilst most of the hairs in an attack by a neo-endothrix present the typical aspect, the rest shew filaments of mycelium attached to the surface of the hair or lying between the hair and the follicle. With ordinary endotriches the invasion stage is so short that it may easily be missed; with neo-endotriches it is so prolonged that the observer cannot fail to find it, and may indeed mistake the case for one of trichophytosis due to an endo-ectothrix.

The other group of trichophytons, the endo-ectotriches, is also divided into two—those with small spores (*microïdes*) and those with large spores (*mégaspores*). The *microïdes* are all pyogenetic, and are responsible for many kerions. They are characterised not only by the smallness of their spores, but also by the fact referred to above, that these form a sheath outside the hair like that of the microsporons, but with the chain-formation which is never present in microsporosis.

Another mode of classifying the trichophytons is into groups according to their cultures. Of *endothrix* cultures there are three main types—(1) the crateriform or sub-crateriform (resembling the crater of a volcano), white, cream-coloured (Fig. 18) or primrose-coloured; (2) the acuminate ("like a mountain-peak"), grey or yellowish in colour; (3) the violet. The violet culture is quite distinct from the others; but the acuminate and crateriform possess characters in common, and the type is more crateriform than acuminate. The culture of the two *neo-endotriches* is cerebriform in character. The *endo-ectothrix* cultures are (1) the gypseum, the large white plastery type (Figs. 19, 20); (2) the niveum, the large white downy type (Fig. 21); (3) the large velvety type; (4) the faviform type (Fig. 22). The first and second of these groups are small-spored endo-ectotriches; the third and fourth, large spored. There is also a single species, with a yellow, powdery culture, which causes in man the eczema

marginatum of Hebra, and which, although ranked as a trichophyton, is

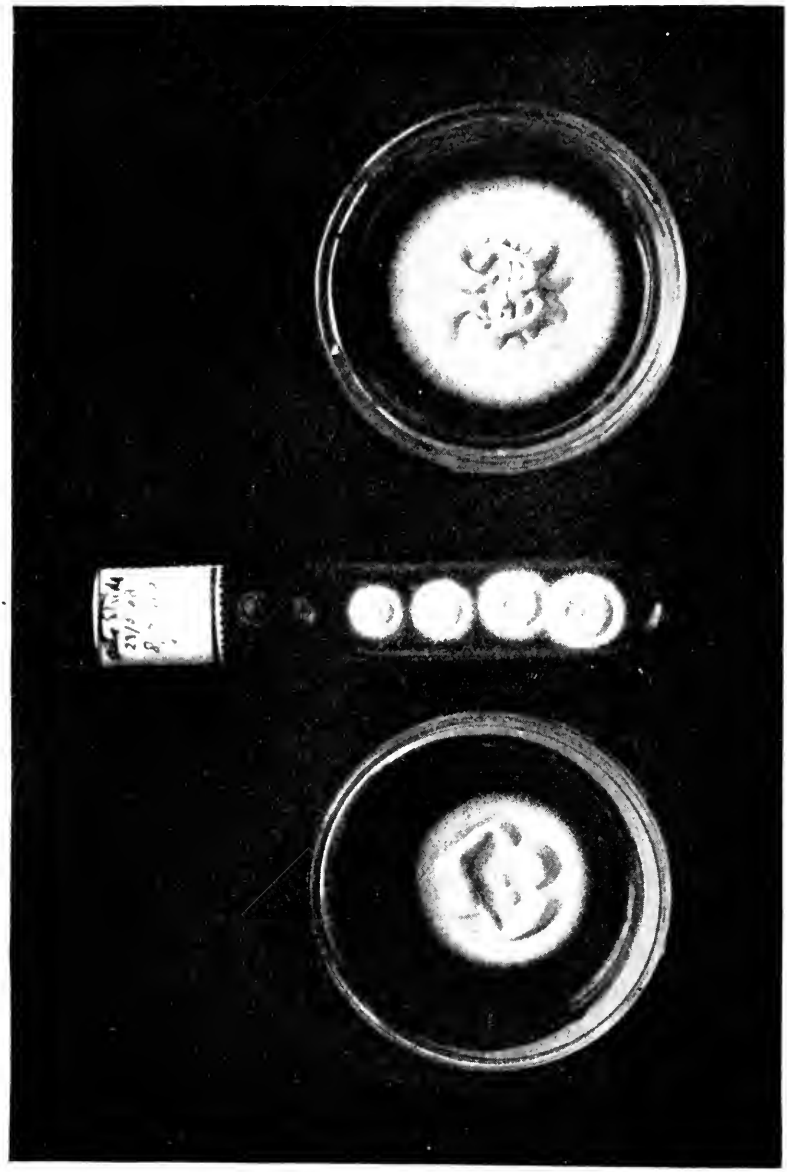

FIG. 18.—Cream-coloured crater (*Trichophyton crateriforme*, Sabouraud), shewing the simple formation in a test-tube and elaboration on Petri dishes. (T. Colcott Fox.)

known as *Epidermophyton inguinale* (*vide* p. 141). These nine cultural groups may be more succinctly reduced to four—(1) the crateriform;

(2) those with large white growths, either powdery or velvety; (3) faviform; (4) *Epidermophyton inguinale.*

The faviform parasites are classified with the trichophytons rather

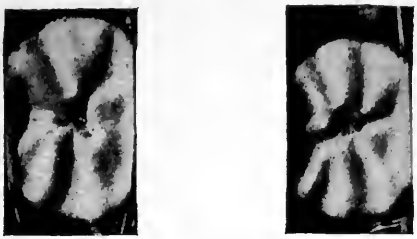

FIG. 19.—Gypseum cultures of *Trichophyton lacticolor*, culture of 25 days. (Sabouraud.)

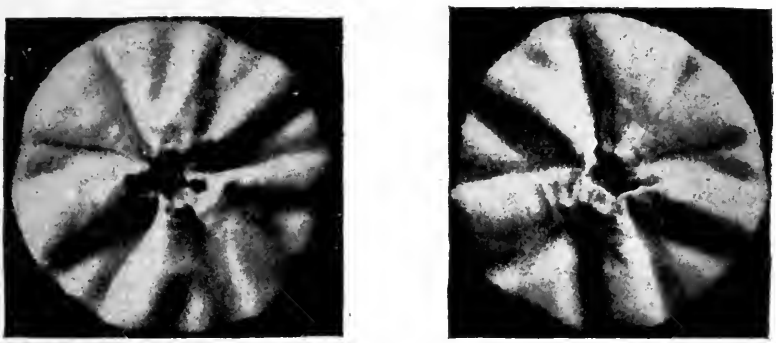

FIG. 20.—Gypseum cultures of *Trichophyton lacticolor*, culture of 45 days. (Sabouraud.)

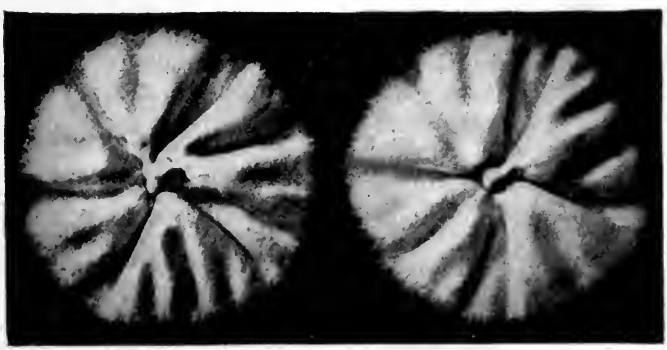

FIG. 21.—Downy cultures of *Trichophyton rosaceum*, culture of 45 days, pleomorphic form. (Sabouraud.)

than with the achorions because of the character and clinical course of the lesions, and also because of the appearance of the fungus in the hair. Three forms have been defined — *Trichophyton ochraceum*, *Trichophyton album*, and *Trichophyton discoides*, and all appear to be of animal origin. Under the microscope the fungus in the scales shews as wavy, jointed

mycelium. Around the shaft of the hair a sheath of spores is seen, as in microsporosis, but with much larger spores, and there is a tendency to chain-formation. Inside the hair are ribbon-like filaments of mycelium.

FIG. 22.—Faviform cultures of *Trichophyton ochraceum*, culture of 3 months. (Sabouraud.)

In the following list of trichophytons the more important species in a clinical sense are italicised, and the subsidiary species are indented :—

## I. *Endothrix.*

Crateriform Culture.
1. *Trichophyton crateriforme* (Sabouraud, 1893).
2. *Trichophyton sulphureum* vel *Trichophyton crateriforme flavum* (Colcott Fox, 1908).
3. Trichophyton effractum (Sabouraud, 1909).
4. *Trichophyton fumatum* (Sabouraud, 1909).
5. Trichophyton umbilicatum (Sabouraud, 1909).
6. Trichophyton regulare (Sabouraud, 1909).
7. Trichophyton exsiccatum (Uriburu, 1909).
8. Trichophyton polygonum (Uriburu, 1909).
9. Trichophyton circumvolutum (Sabouraud, 1902-1909).

Acuminate Culture.
10. *Trichophyton acuminatum* (Sabouraud, 1893).
11. Trichophyton pilosum (Sabouraud, 1909).

Violet Culture.
12. *Trichophyton violaceum* (Sabouraud, 1892).
13. Trichophyton glabrum (Sabouraud, 1909).

## II. *Neo-endothrix.*

Cerebriform Culture.
14. *Trichophyton cerebriformé* (Sabouraud, 1893).
15. Trichophyton plicatile (Sabouraud, 1909).

## III. *Endo-ectothrix with Small Spores.*

Gypseum Culture.
16. *Trichophyton asteroïdes* (Sabouraud, 1893).
17. Trichophyton radiolatum (Sabouraud, 1910).
18. Trichophyton lacticolor (Sabouraud, 1910).
19. Trichophyton granulosum (Sabouraud, 1908). (Observed only in an animal epidemic.)
20. Trichophyton farinulentum (Sabouraud, 1910).
21. Trichophyton persicolor (Sabouraud, 1910).

Niveum Culture.
22. Trichophyton radians (Sabouraud, 1894).
23. Trichophyton denticulatum (Sabouraud, 1910).

IV. *Endo-ectothrix with Large Spores.*

Downy Culture.
24. Trichophyton rosaceum (Sabouraud, 1893).
25. Trichophyton vinosum (Sabouraud, 1910).
26. Trichophyton equinum (Matruchot and Dassonville, 1898).
27. Trichophyton caninum (Matruchot and Dassonville, 1902).

Faviform Culture.
28. Trichophyton ochraceum (Sabouraud, 1909).
29. Trichophyton album (Sabouraud, 1909).
30. Trichophyton discoïdes (Sabouraud, 1909).

V.

31. Epidermophyton inguinale (Sabouraud, 1908.)

The endothrix group is responsible for the great majority of cases of scalp trichophytosis, both in London and in Paris, and some of the species may also attack the hairless skin, the beard, or the nails. But the endo-ectothrix group accounts for a great majority of ringworms of the hairless skin, and for a small minority of juvenile scalp ringworms, for nearly all the cases of adult ringworm in all sites, and for the majority of specially inflammatory cases. Among the endotriches, the species most often encountered are *Trichophyton crateriforme* and *Trichophyton acuminatum*. In a series of some hundreds of scalp trichophytoses in London, Dr. Colcott Fox found that *Trichophyton crateriforme* was responsible for 38 per cent of the cases, and *Trichophyton acuminatum* for 26 per cent. *Trichophyton violaceum* was the parasite in 15 per cent of the cases, and *Trichophyton sulphureum* in 21 per cent. Of 100 cases of endothrix ringworm of the scalp at the St. Louis Hospital, Paris, 50 were due to *Trichophyton crateriforme*, 30 to *Trichophyton acuminatum*, and 15 to *Trichophyton violaceum*, whilst *Trichophyton sulphureum* was not met with in a single instance. In Sabouraud's more recent list of 500 cases of dermatomycoses in Paris, out of 211 endothrix scalp ringworms, *Trichophyton crateriforme* was the parasite in 112 cases, *Trichophyton acuminatum* in 47, and *Trichophyton violaceum* in 35, all the other species accounting between them for only 17 cases. The eyebrows and eyelashes may be attacked by both endotriches and endo-ectotriches.

To recapitulate:

1. Ringworm is pre-eminently an affection of children.

2. The scalp, and especially the juvenile scalp, is vulnerable to the attacks of a great many of the fungi of both families, but the cases are very largely due to *M. audouini* and to endothrix trichophytons.

3. The glabrous skin is rarely attacked by microsporons.

4. The beard is infected by trichophytons only.

5. The nails are seldom involved, and only by trichophytons. What species are most concerned it is impossible to say, owing to the difficulty of growing cultures.

6. Adults are seldom attacked except by endo-ectotriches, and this group is also responsible for many ringworms of the hairless skin.

7. The parasites with which the clinician is most concerned are eight in number: among the microsporons, *M. audouini*, *M. felineum*, *M. canis*, and *M. tardum*; among the trichophytons, *Trichophyton crateriforme*, *Trichophyton acuminatum*, *Trichophyton sulphureum*, and *Trichophyton violaceum*.

*Culture Medium.*—On proof medium many ringworm parasites appear after a time as tufts of pleomorphic white down, representing a degeneration of the mother-culture, to which the sub-cultures never return. This phenomenon may be avoided by using a medium in which there is no glycerin or glucose.

**Tinea Tonsurans.** *Signs and Symptoms.*—Ringworm of the scalp is almost peculiar to childhood. Liability to attack continues up to puberty, but the majority of cases occur in children in the second half of the first decade of life. There is practically no difference between the sexes in respect of liability. The incubation period, though variable, is not usually longer than a fortnight.

The *microsporic form* of tinea tonsurans often begins as a small red papule which appears about the orifice of a hair follicle. The papule spreads peripherally, becomes scaly on the surface, and in a short time grows into a patch round or oval in outline, from 1 to 2 inches in diameter, and slightly raised. Similar patches are formed in the same way from other centres of infection, and the running together of neighbouring patches may give rise to areas of thickened desquamating integument with winding contours. The typical patch has a distinct margin, often marked by a narrow zone of erythematous redness; and it is studded with dry, withered stumps of broken hair. The affected hairs have lost their natural gloss, and have a whitened, frosted appearance, due to the parasitic sheath which surrounds them. Each stump projects from a cone-like elevation thrown up around the hair by the massing of epithelial debris, caused by the burrowing of the fungus in the follicle. It is thickened, owing to infiltration with the fungus, is dull-grey or blanched, is extremely brittle, and is so loose that it can be pulled out without pain. The grey sheath extends nearly to the bulb; it makes the hair, as Sabouraud has said, look like a sticky rod rolled in sand. In uncomplicated ringworm, itching is the only subjective symptom, but this is not invariably present. The affection causes no disturbance of the general health. It sometimes runs a very rapid course, especially in very young children. The whole scalp may in time be laid waste, its surface being covered by a thick layer of dry epidermic scales. On long-standing patches there may simultaneously be seen thickened stumps and downy new hair.

Usually the only inflammatory reaction in the scalp is the desquamation, but in young children red rings occasionally appear. In rare cases, however, pronounced inflammation, vesicular, eczematoid, or impetiginous, appears, and there may be diffuse suppuration.

An anomalous form of the affection is *bald ringworm* (Liveing) or *tinea*

*decalvans* (Tilbury Fox). The hair falls out in places, leaving a smooth bare spot. Other patches generally become bald in like manner, and an appearance similar to alopecia areata is produced.

Tinea tonsurans of the *trichophytic* form is mainly, as has been stated, endothrix. In a typical case the head is scurfy, and there are small patches of broken hairs, sometimes coalescing into large patches. With

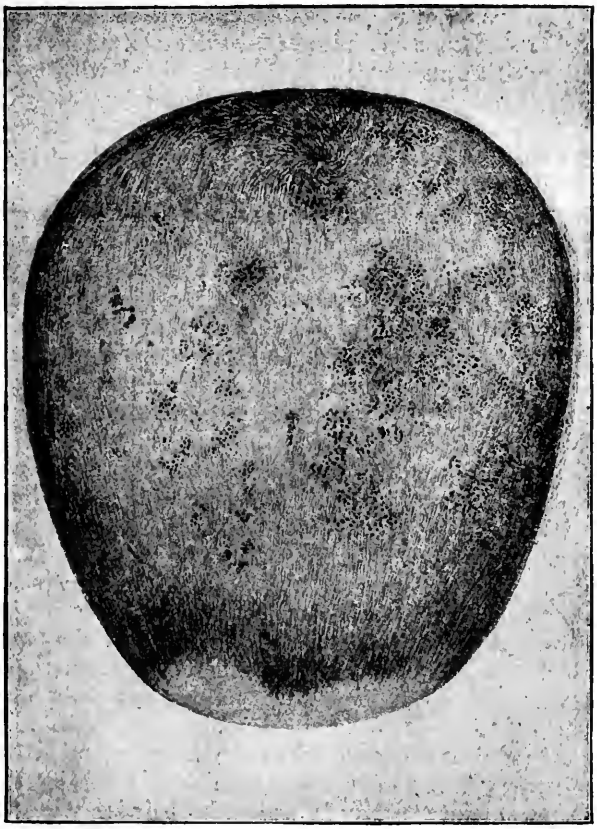

FIG. 23.—"Black-dot" ringworm, due to an endothrix trichophyton. (T. Colcott Fox.)

a lens dark dots are seen on the surface of the scaly patches among the remaining healthy hairs: hence the name "black-dot ringworm" (Fig. 23). When the whole scalp is thus affected the condition is known as "disseminated ringworm" (Aldersmith). The dark spots are simply pigmented coiled-up hair-stumps, the growth of which is prevented by an accumulation of scales at the mouth of the follicle, for, on removal of the scales, the stumps tend to normal growth. A characteristic feature of endothrix trichophytosis is that some only of the hairs in a patch are affected. In children with long hair, therefore, the disease is easily

overlooked, or it may be interpreted as a slight pityriasis. Occasionally the microsporon pattern is to some extent imitated, and this, in the experience of Dr. Colcott Fox, is not characteristic of any one of the endotriches, but has been noted in them all. In many cases the affected hairs are more or less hyperpigmented, due, it has been suggested, to the breaking-up of keratin. Lenticular rosy macules often appear about the neck and face, etc., and are apt to recur.

In rare cases the condition known as *kerion* arises. The skin is raised into a dome-like surface, sometimes of considerable extent; the surface, angry-looking, smooth and moist, is thickly dotted with small holes—dilated follicles—from some of which a loose stump of hair projects, while others are plugged with muco-purulent matter, and yet others are empty. The swelling is tender and feels boggy, but there is no distinct fluctuation under pressure, and after incision there is little or no escape of pus. The suppuration is localised in the follicles, and at the bottom of each follicle is a tiny abscess. The abscess loosens the hair, and as the hairs fall out, the way is opened for the escape of viscid pus. After the swelling disappears, the site remains for some time red and bare, and it may be long before a fresh growth of hair takes place. In rare cases the roots of the hair are destroyed, and the affected area remains permanently bald. Kerion, formerly conjectured to be the result of secondary infection by other parasites, may now be regarded as directly due to pyogenetic trichophytons.

*Diagnosis.*—Ringworm of the scalp is, as a rule, easily recognisable. From pityriasis of the scalp and from psoriasis of the hairy skin it is distinguished by the broken hairs, for in those affections the hairs fall out unbroken. When a condition resembling impetigo is set up, the characteristic broken stumps will still indicate the true nature of the disease. Confusion between bald ringworm (tinea decalvans) and alopecia areata is prevented by the billiard-ball smoothness of the patches in the latter affection, and by the shape of the short hairs sometimes found at the edge of the patches, for they are not bent, but resemble a note of exclamation (!). Microsporosis and trichophytosis of the scalp, though difficult to distinguish clinically when the latter affection assumes the microsporic pattern, may be diagnosed from each other by the arrangement of the spores, and the way in which the hair is attacked, as above described.

*Prognosis.*—Scalp ringworm usually ends in cure at puberty, if not before. I have, however, seen a few cases in which the disease has lasted from childhood to beyond the age of twenty-five. Kerion naturally leads to the cure of ringworm, the diseased hairs being cast off and the multiplication of the pus cocci having the effect of choking the growth of the fungus. The trichophytic form is usually more persistent than the microsporic, and disseminated ringworm is usually extremely obstinate, mainly, perhaps, because it is easily overlooked. The disease is greatly mitigated by age. Other things being equal, ringworm of the scalp in a child of fifteen, is much milder than in a child of ten. Neither the

severity nor the duration of the disease appears to be influenced by the constitutional state.

*Treatment.*—To the earlier methods of treatment scalp ringworm is often refractory. Many substances are capable of killing the ringworm parasite, if they can be brought to close quarters with it, but where there is strong hair-growth it is impossible to get the remedy sufficiently deeply into the hair follicle, or through the hair cuticle into the diseased hair. It is only when the hair is not deeply implanted, as in some young children, that a purely parasiticidal substance suffices to effect a cure. Hence the necessity, in all ordinary cases, for epilation. Hence, too, the advantage which radiotherapy possesses over other methods of treatment; for the rays effect a cure, not by killing the fungus, but by securing expeditious epilation, and thus removing the parasite with the diseased hair. By this means cases of ringworm, which formerly, on an average, were not cured in less than twenty-seven months, can now be cured in a few weeks. The treatment must be applied with skill and judgment, so that the risk of setting up a dermatitis may be avoided. But the danger sometimes apprehended of injuring a child's brain and arresting its development has been proved by experience to be a mere chimera. The scalps of tens of thousands of children have been irradiated without a single ascertained case of harmful consequences to the brain. It is now possible so to measure the dosage of the rays as to avoid dermatitis; and it would be absurd to suppose that that which does not harm the skin can injuriously affect the underlying cerebral tissue. Radiotherapy would not, of course, be applied to infants before the anterior fontanelle has closed; that being assumed, the fear of arresting the development of the child's brain may be dismissed as idle and baseless.

It is impossible here to enter into the details of *x*-ray treatment of ringworm. I may, however, say that experience has proved to me the desirability of choosing a fairly low and soft tube, and of tuning it up on one's own apparatus by frequently passing through it a small current until the desired state of vacuum is reached. A simple non-regulating tube with a single anode is, I believe, better than any regulating or bi-anodal or heavy anode tube. When the vacuum has become too high a slightly heavier current than that generally used will reduce the vacuum by making the anode red hot, and the tube will remain constant for long periods by keeping the anode a dull to a bright-red colour and varying it as required. By the Sabouraud-Noiré pastille method the amount of rays necessary to produce epilation can be determined, the pastille of platinocyanide of barium changing to a standard colour after exposure to the rays for a given length of time. It is not necessary, however, to rely alone upon this method; the milliamperemeter, amperage in the primary circuit, the spark-gap, the appearance of the tube and anode, and the time of exposure should all be carefully watched and kept as constant as possible. Where complete epilation is necessary the length of time occupied by the exposures may be materially reduced by the

Kienböck-Adamson method, of which Dr. Adamson (2) has published a lucid description with illustrations. It consists in dividing the scalp into rectangular areas and irradiating each area (surrounded by a lead-foil shield) in succession. No cylindrical or lead-foil localisers are necessary, the doses being so aimed that where overlapping occurs the incidence of the rays is so oblique and so much farther from their source that no excessive dose is given. Thus an even radiation is secured, and the time occupied in raying the whole scalp is reduced from $3\frac{1}{2}$ to 4 hours to $2\frac{1}{2}$ to 3 hours.

If the older methods of treatment be employed, it is important to begin by securing a clear field of action. Unless the disease be strictly confined to one or two small spots, and very superficial, epilation will be required. All visibly diseased hairs should be picked out with forceps, and a ring of sound hair around the seat of disease should also be removed, so as to isolate the affected area. In very young children, however, epilation is not generally advisable; but in all, the hair all over the head should be kept clipped to a length of about half an inch, so as to facilitate a survey of the whole scalp. Diseased areas, including commencing spots, may, as advised by Dr. Colcott Fox, be painted with an aniline pencil, and should never afterwards be lost sight of. A head-covering of linen or other cool and inexpensive material should be worn day and night. For application to the healthy surface of the scalp, Sabouraud recommends tincture of iodine diluted with three volumes of 90 per cent alcohol or eau de Cologne. This is not only an unirritating parasiticide, but it helps, he finds, to disclose diseased areas not before noticed. Other unirritating parasiticides are carbolised glycerin and vaseline. If the case be recent, the application of strong iodine or blistering fluid may, as in the case of ringworm of the body, have the effect of removing a large quantity of the fungus. This, however, should not be done too frequently, lest from the repeated inflammation thickening should result.

The next step should be to open up a free way into the interior of the follicles by clearing away obstructing fat and epithelial debris from their orifices. The parts should, therefore, be washed with spirit and ether lotion, so that fatty substances may be dissolved and the tissues dehydrated. In passing it may be mentioned that, since water is one of the nutritional requirements of the fungus, ringworm sites should never be washed with that fluid. Mild antiseptic washes, may, however, be applied. A suitable lotion is salicylic acid dissolved in chloroform or ether (gr. v.-xx. ad ℥j.); this not only dissolves the fat and dehydrates the tissues, but loosens the hairs, and directly attacks the fungus. If applied sufficiently early, salicylic acid in this form may effect a rapid cure.

But these remedies penetrate only a short distance into the epidermis. In chronic cases the aim must be to set up a curative dermatitis. In such circumstances chrysarobin is the most effective agent. It may be applied in the form of an ointment containing from gr. x. to ℥ii. of

chrysarobin to the ounce; the strength best adapted for ordinary use is gr. xx. to the ounce. I usually begin with a strength of gr. x. to the ounce. A small quantity of the ointment should be well rubbed in with a bit of cloth or a mop. The drawbacks to this drug are that it causes a peculiar erythematous swelling of the eyelids and face, which, however, quickly passes away; it also dyes the hair yellow, and stains linen and cloth indelibly.

Sulphur is particularly useful in the case of young children; it may be applied in the following form: — ℞ Sulphuris ʒj., acidi carbolici ʒss., lanolini c. oleo ℥j. Sulphur may also be used in combination with mercury, salicylic acid, etc., in an ointment with a lanoline base.

Mercury, in the form of the perchloride, the biniodide, the oleate, the nitrate, the red oxide, is used in lotions, ointments, or plasters; in whatever form it is applied the strength of the preparation must be adapted to the tolerance of the patient, and its effect carefully watched. In very young children, or in persons with a delicate skin, it should never be employed. The perchloride of mercury may be applied in alcoholic or ethereal solution in strengths varying from ½ to 2 per cent. Dr. Aldersmith, who first drew attention to the use of this preparation in the treatment of ringworm, has sometimes seen it "cure the most inveterate and extensive cases." He admits, however, that a few children have seemed to decline in general health while undergoing the treatment.

Iodine, in the form of the tincture or the liniment (B.P.), not infrequently cures early cases. "Coster's paste," which is often effective, contains iodine, and is composed as follows: ℞ Iodine, ʒij., light oil of wood or tar to ℥j. The application causes the formation of a scab; when this separates, the remedy can be applied again if necessary. Sodium hyposulphite, which was strongly recommended by the late Sir William Jenner, has sometimes given excellent results in my hands. It may be applied as a lotion (ʒij. in ℥j. of water) on lint, and covered with oiled silk. It is chiefly useful in cases of young children. Tar is sometimes of service. It may be combined with iodine, as in Coster's paste. Thymol may be used in an ointment (gr. v. to ʒss. in ℥i.); dissolved in turpentine (ʒss.-j. in ℥j.) it is sometimes an effective application. In very recent cases, after the scalp has been cleared of diseased hairs, I sometimes use thymol or menthol (ʒss.) with chloroform (ʒij.) and olive oil (ʒvj.).

My general plan of treatment in chronic cases is as follows:—After removal of the hair the scalp is washed once with soft soap and spirits of wine, or with spirits of wine and carbolic acid or perchloride of mercury. When the surface is dry, chrysarobin is rubbed in for ten minutes, care being taken that none gets into the eye. The ointment should be applied on subsequent days till the part becomes tender, or till a red halo is visible. The chrysarobin should then be discontinued, and an ointment, either of boric acid or oleate of zinc, applied. As soon as the tenderness has disappeared, the chrysarobin should again be used. This time inflammatory reaction is longer in shewing itself. In order to obtain

a rapid cure, however, it is essential to produce the "chrysarobin crisis." If after three such "crises" a very well-marked improvement has not been effected, sulphur should be tried instead of chrysarobin; if this does not answer, recourse should be had to mercury, and this failing, to iodine.

In some cases a more destructive inflammation, producing a condition resembling kerion, is required. For this purpose Dr. Aldersmith uses croton oil. The croton-oil treatment is strongly favoured also by Dr. Colcott Fox and by Sabouraud. As the result of his wide experience, Dr. Colcott Fox holds it to be the most certain and the most effective treatment we possess. He applies an ointment, containing ℥j. of croton oil to ℥j. of a base, and it is rubbed in daily, or as often as may be necessary to excite the desired degree of inflammation, which is maintained by reapplication until all the diseased stumps have fallen or been epilated. Pus is regularly cleansed away and crust-formation obviated. Croton oil is painless when there is already inflammation; but this treatment should not be undertaken by the inexperienced.

Vidal's treatment aims at the destruction of the fungus by deprivation of air. The hair is cut close, the head is rubbed with essence of turpentine, and the affected parts are painted with tincture of iodine. Then the head is smeared with vaseline, either pure or containing boric acid or iodine (1 per cent), and covered with a caoutchouc cap or a gutta-percha leaf kept closely applied to the scalp with a bandage. The dressing is renewed morning and night, the parts being washed with soap and water and carefully dried.

A case of ringworm of the scalp cannot be said to be cured till the most minute inspection reveals no broken or diseased hair, and till the absence of any trace of the fungus is confirmed by microscopic examination, which, for greater safety, may be supplemented by culture experiments. My own rule is, after a careful examination, to leave the case untreated for a month; at the end of that time, if no short hairs can be found, if the part is free from scaliness, and the new hair is sufficiently grown to cover the patch, I look upon the patient as cured.

**Tinea Sycosis**, or **Tinea Barbae.**—Ringworm of the chin and other hairy parts of the face is a follicular inflammation set up mainly by endo-ectothrix trichophytons derived from the horse, the calf, etc., but due in some instances to endothrix trichophytons (Fig. 24) that yield acuminate and violet cultures. Darier, however, recognises a microsporosis of the beard. Tinea sycosis is most common in young adults of the male sex, and is rare after middle age. It may result from direct contact with affected animals, but the shaving-brushes and other instruments of the barber are frequently, as in sycosis, the medium of conveyance. Tinea of the eyelashes and eyebrows is occasionally met with—more frequently in Italy than elsewhere. In France it is almost unknown.

*Signs and Symptoms.*—The initial lesion is a red, scaly spot, which

quickly extends, sometimes undergoing involution in the centre and forming a ring; in other cases retaining the character of a patch, with a defined margin and scaly surface. As other lesions develop they often become confluent. Pustules, each of them traversed by a hair,

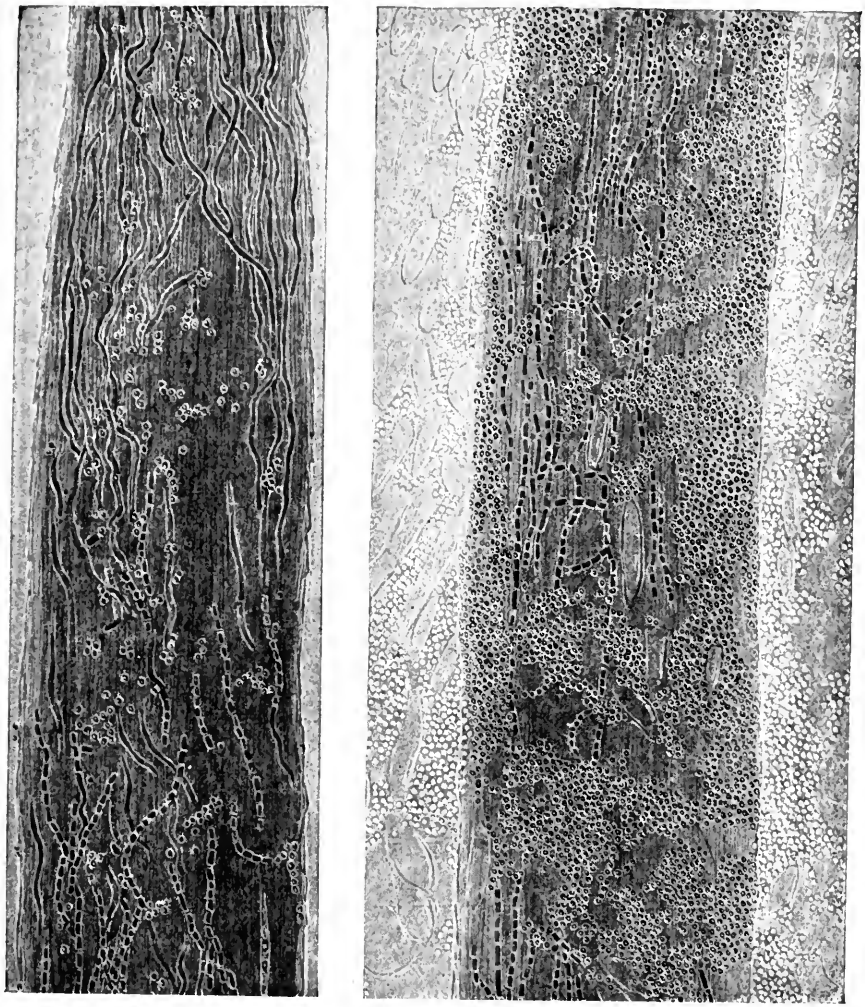

FIG. 24.—Hair of beard invaded by a small-spored trichophyton (*Trichophyton asteroides*) × 260 (Sabouraud).

form both on the surface of the patches and on the intervening skin. The hairs are often withered-looking, and can be drawn out without pain. The eruption is attended by pronounced itching. In rare cases the affection assumes a kerion-like form, when there is brawny infiltration of the skin of the chin and sides of the face; the surface is red and

glistening, thrown up here and there into irregular lumps studded with hair-pierced pustules, and presenting the dilated mouths of follicles, from which a viscid fluid exudes. As a rule the hair, though loosened, is not damaged; the suppuration may, however, be severe enough to destroy the follicles, leaving permanent scars, on which no hair can grow.

*Diagnosis.*—To distinguish tinea barbae from sycosis the aid of the microscope must in many cases be sought; but clinically the trichophytic disease spreads more rapidly and causes more lumpiness of the affected surface. From eczematous folliculitis it is distinguished by the absence of serous discharge. In the eczematous condition, too, there is little or no loosening of the hairs, nor is the affection confined to the hairy parts.

*Prognosis.*—Tinea barbae may persist indefinitely if left untreated; but perseverance with suitable treatment is usually rewarded with cure.

*Treatment.*—Remedial action must proceed on the same general principles as the treatment of ringworm of the scalp. In the early stage, when the only visible lesions are erythematous rings, the hair should be cut close, and tincture of iodine applied, the application being repeated until thorough desquamation has taken place. If there is much suppuration, the *x*-ray treatment must be deferred until this has subsided. In cases in which the rays are not available, epilation with forceps should be carried out piecemeal. This will suffice to give exit to the pus. Parasiticides must then be applied, with due regard to the condition of the affected parts and the susceptibility of the skin. Chrysarobin, in the form of an ointment (gr. x. to ʒss. of the drug to ℥j. of lanoline or lard), is the most efficient agent. Sulphur or oleate of copper, is useful in the milder forms. Neither incision nor scarification is ever required. The case must be kept under observation for a long time after apparent cure.

**Tinea Circinata.**—Ringworm of the glabrous skin is usually a trichophytic infection, set up either by endotriches or by endo-ectotriches; but in rare cases it is due to microsporons, and notably to *Microsporon lanosum*. It may occur at any time of life, but is rare after middle age. The parts chiefly affected are the hands and forearms, the face and neck.

*Signs and Symptoms.*—The first visible lesion is a small, red, slightly raised spot, which gradually spreads at the edge and becomes scaly. The redness fades away at the centre, leaving a slightly discoloured branny area which forms the inside of a red ring. Gradually the circle enlarges, without any widening of its edge. Sometimes there is only one ring. More frequently there are several, and those adjoining each other may run together and form festooned patterns. As a rule the rings are not arranged symmetrically. In many cases involution does not take place in the centre as the edge advances, so that the lesions take the form not of rings but of patches with a clearly defined border. There is usually inflammation, varying according to the fungus or the idiosyncrasy of the skin. The ring or patch often becomes the seat of a papular

or vesicular eruption, and pustules may develop from inoculation with pus cocci and other micro-organisms as the result of scratching. Occasionally the neighbouring lymphatic glands are slightly enlarged. The affection may involve the buccal mucous membrane by extension from the face. When the palms of the hands are affected the lesions are almost always unilateral. In rare cases the soles of the feet are attacked. The only subjective symptoms of tinea circinata are tingling and itching.

*Diagnosis.*—This form of ringworm has to be distinguished from ordinary eczema, from seborrhoeic eczema, and from pityriasis rosea. But the characteristic appearance of the lesions seldom leaves room for doubt as to the nature of the disease. When there is any difficulty the microscope will remove it.

*Prognosis.*—This is always favourable, for, as I have said, there is an abundance of parasiticides, and there is no difficulty, as there is in ringworm of the hair, in bringing them to close quarters with the fungus.

*Treatment.*—The most effectual measure is to remove the superficial layers of the epidermis by means of blistering fluids, such as iodine or liquor epispasticus. If some of the fungus be left in the deeper layers of the rete, chrysarobin should be applied, in the form of an ointment (gr. xx. to ℥j. of lanoline), or of Unna's ung. chrysarob. co. (chrysarobin 5 parts, salicylic acid 2 parts, ichthyol 5 parts, unguentum simplex 100 parts). Other useful applications are ointments composed of oleate of copper or oleate of mercury gr. iij., lanolini cum oleo ℥j.; or sublimed sulphur gr. iij., acid. carbol. ♏xx., lanolini ℥ij., ol. oliv. ℥ij.; rubbed in thrice daily. For young children a milder application, such as hydrarg. ammon. gr. iij., lanoline or lard ℥j., is advisable.

**Onychomycosis.**—The nails may be attacked either independently, or, more frequently, in association with trichophytosis of the beard or of the glabrous skin. The affection is met with oftener in adults than in children, and nurses in attendance upon children affected with trichophytosis are specially liable.

*Signs and Symptoms.*—Greyish stains first appear—ordinarily as a sequel to some lesion of the hand—under the free border or the lateral borders of the nail, and at the root. Inflammation of the matrix is set up and the nail loses its lustre, becomes thickened, spongy, uneven, and more or less brittle. Exfoliation occurs, and under the free border is seen a mass of disintegrated nail structure, in which the fungus will be found. As a rule several nails are attacked.

*Diagnosis.*—The affection has to be distinguished from the onychomycosis of favus, in which the stains under the borders of the nail are yellower, while the mycelial elements are shorter and more irregular. If there is any doubt left, a scraping should be taken and examined under the microscope.

*Prognosis.*—The affection is indolent, and refractory to treatment. The lesions may clear up spontaneously, but they may persist for four or five years, and in rare cases for much longer periods.

*Treatment.*—The radical surgical treatment is avulsion under anaesthesia, followed by applications to prevent infection of the new nail. It is generally sufficient, however to scrape the nail thin, and then, after softening it with potash soap, to apply chrysarobin or some other parasiticide. Dr. A. J. Harrison uses two solutions: No. 1 composed of liquor potassae and distilled water (āā ℥ss.) and iodide of potassium (℥ss.); and No. 2 consisting of perchloride of mercury (gr. iv.), spirits of wine and distilled water (āā ℥ss.). The nail having been scraped, No. 1 is applied on lint under oiled silk for fifteen minutes; No. 2 is immediately applied in the same way, and kept on for twenty-four hours. The nail is then scraped again, and the applications are repeated as often as may be necessary.

H. Fournier recommends the removal of the whole of the affected parts by scraping, scratching, or avulsion, and by the action of various local remedies, such as creosote, acetic acid, benzine, corrosive sublimate (2 per cent in alcohol or chloroform), mercurial plaster, resorcin, or tincture of iodine. The two last-named agents, combined with previous maceration of the nail by means of india-rubber coverings, are those which Fournier has found most successful.

**Prophylaxis of the Ordinary Ringworms.**—Before noticing the more exotic forms of ringworm, it may be pointed out that the disease could be stamped out if every case were properly isolated, and if medical men were more careful in giving certificates of cure. No certificate should be given until the complete and permanent disappearance of the fungus has been proved in the manner already described. All children should be carefully examined by a competent observer before admission to school, public or private; and this inspection should be repeated each time the school reassembles after holidays of any length. To some extent this precaution is now taken, but it should be made compulsory and universal. As I suggested at the International Congress of Hygiene and Demography in 1891, in all large towns children suffering from obstinate forms of the disease should be drafted into special schools, as is now done in the metropolis, and as had been done years before in Paris.

**Eczema Marginatum.**—Of this ringworm, more common in tropical countries than in Europe, and at times epidemic, Hebra published in 1860 a clinical description which has become classical. The name he bestowed upon it, however, is not a happy effort in nomenclature, for the affection is not essentially an eczema. *Tinea marginata*, as I have said, would be a better designation. Three years before Hebra's description appeared, the affection was recognised as a trichophytosis by Devergie.

*Etiology.*—The affection is caused by a parasite which Sabouraud designates *Epidermophyton inguinale.* Though he includes it among the trichophytons, its habits have no resemblance to those of any other known species, nor can it be traced to any source outside man. Unlike all other trichophytons it never attacks the hair, but remains in the horny epidermis. It gives a yellow-orange culture, dry and powdery, but often white and velvety by pleomorphism. It is remarkable for the rapidity with which, under culture, it develops forms of degeneration (Fig. 25). The attempts to inoculate man and the lower animals with cultures have yielded negative results. Perrin of Marseilles has shewn that there is reason for believing that the disease may be communicated in sexual congress, and Tilbury Fox that it may be communicated in the contact of family life.

FIG. 25.—Degeneration of a culture of *Epidermophyton inguinale* after 90 days. (Sabouraud.)

*Symptoms.*—The lesions may spread over the lower part of the belly, the groin, the buttocks, the fold of the nates, the axillae, and other parts where the skin surfaces are in contact; but the hair is not attacked. The mucous membrane of the vulva may be involved. The characteristic feature of the lesions is their broad bluff margin, scaly and mostly rough with papules (Fig. 26). The process often assumes an eczematoid character. The affection appears more often in man than in woman, and more often in young than in middle-aged or old men.

*Treatment.*—Chrysarobin may be used as an ointment (ʒss. of the drug to ʒj. of lanoline). This failing, a 1 per cent solution of naphthol in alcohol, or a 5 per cent naphthol ointment, may be tried. Sabouraud recommends vigorous friction with a hard pencil moistened with tincture of iodine 10 grams and alcohol (90 per cent) 100 grams, the treatment to continue from ten to fifteen days. Another mode of treatment, which is said by Dr. Jamieson to be the most efficacious of all, is to apply a freshly prepared solution of sulphurous acid freely to the parts several times a day.

Dr. Arthur Whitfield has reported three cases of unusual trichophytic infection in which the clinical features of the eruption were not characteristic of the disease. In the first case, the skin and nails of the toes of a man who had lived in China were affected by a condition resembling eczema; the second case was one in which a man and his wife and maid suffered from peeling and itching of the soles of both feet, and the wife and maid also contracted the disease slightly in the palms from washing his stockings. The third case consisted of a vesico-bullous eruption on the dorsal surface of the right forefinger and right hypothenar eminence of a young woman. The condition was similar to the acute eczema of the

hands so commonly seen during great heat, but the history pointed to infection from a mouse. Microscopical examination revealed trichophytic mycelium in all the cases. Sabouraud (43*a*) has also described a case of trichophytic infection, due to the *Epidermophyton inguinale*, in which the patient, after being cured, returned with eczematiform or dysidrotic vesicles on the fingers and toes. As the patient gave a history of having communicated the disease to some one else, the scales were examined and shewed the characteristic mycelium of eczema marginatum. Since that

FIG. 26.—Eczema marginatum. (Sabouraud.)

time, of seven cases of intertrigo or intertriginous eczema of the toes, Sabouraud found that four gave parasitic cultures—made with much difficulty—shewing the characters of the *Epidermophyton inguinale*. The feet are attacked more frequently than the hands. The favourite site is the bottom of the interdigital fold, chiefly of the fourth and fifth toes. Farther away from the bottom of the fold, the lesion becomes more definitely vesicular. The vesicles dry up and exfoliate, and others appear. The lesions are very chronic, and usually remain limited to and under the interdigital folds. Sabouraud has observed only one case affecting the hands, and the diagnosis was almost impossible without a microscopical examination. These cases of Dr. Whitfield and Sabouraud

point to the necessity, in chronic eczema between the toes and fingers, especially in those who have lived in the tropics, of making a careful microscopical examination to determine if the affection is parasitic.

In connexion with eczema marginatum, I may mention *dhobie itch*, an expression popularly applied to all epiphytic skin diseases of warm climates—from the belief that they are "caught" from clothes that have been contaminated by the dhobie (washerman)—but particularly to eczema marginatum, and similar diseases that specially affect the inguinal region and the axillae. Sir P. Manson is convinced that many cases of dhobie itch are produced by *Microsporon minutissimum* and *Microsporon furfur*. Castellani has separated dhobie itch from ordinary forms of tinea corporis, and by Dr. MacLeod the affection was termed tinea cruris. The former maintains that three known species of epidermophytons are concerned in its production—*Epidermophyton inguinale*, the fungus of eczema marginatum; *Epidermophyton perneti*, described by Dr. Pernet; and a third for which he proposes the name *Epidermophyton rubrum*, from the deep-red pigmentation of its cultures in glucose, Sabouraud- and mannite-agars. He points out that in many cases dhobie itch, beginning in the crutch or the axillae, spreads to other parts of the body, always, however, sparing the scalp (*vide* also "Tropical Diseases of the Skin," Vol. II. Part II. p. 746).

**Tinea Imbricata.**—This form of ringworm, characterised by a concentric arrangement of closely set rings of scaly epidermis, was until lately confined to certain Eastern oceanic tropical climates, but its area of distribution appears to be extending. It has been met with as far westwards as Burma and as far northwards as the coast of China, it is rife in many of the islands of the South Pacific, and it has been reported as occurring in the interior of Brazil. Neither sex is exempt, and children are particularly liable.

*Etiology.*—The fungus is regarded by some authorities as a trichophyton differing little from species of animal origin met with in Europe. Tribondeau, having in one observation found fructification, maintains that it is a lepidophyton and not a trichophyton, and this view finds support in Jeanselme's observations made in Indo-China. The fungus has not yet been cultivated.

*Symptoms.*—At first, as described by Sir P. Manson, the lesions may be confined to one or two spots, but they soon spread over the greater part of the body. Any region may be attacked, but generally the hairy parts, including the scalp are avoided. The characteristic lesion is a patch consisting of concentric rings and scales about one-eighth inch apart. They spread at the edge, not only centrifugally, but towards the centre, so as to cover the rings and the central area. The scales are like pieces of tissue paper; they have a free border and are firmly adherent at the opposite edge, resembling surgical flaps, and they are so arranged that the free border of each is towards the centre of the circle

or system of circles to which it belongs. When they separate, parallel lines rather darker than the fawn colour of tinea versicolor, and having a more or less concentric arrangement, are left. These lines, according to Sir P. Manson, are the fungus, slightly pigmented, proliferating and advancing under the young epidermis. There is usually intense itching.

*Diagnosis.*—From tinea circinata the affection can be distinguished by the abundance of the fungus, the centripetal spread of the process, the absence of marked inflammations or congestion of the rings, their concentric arrangement, and the large size of the scales. It is differentiated from ichthyosis by the concentric arrangement of the scaling, the peripheral attachment of the scales, and the presence of the fungus.

*Treatment.*—This consists in the application of parasiticides, such as linimentum iodi, or chrysophanic acid ointment (gr. xx. to ℥j.), or the rubbing-in of bruised *Cassia alata* leaves. Chrysophanic acid ointment is now in general use among the natives of Tahiti as a prophylactic, with the result that the disease has become less prevalent (*vide* also "Tropical Diseases of the Skin," Vol. II. Part II. p. 747).

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FAVUS.—This mycosis is rare in England, but more common in Scotland. It was almost unknown in New York and other parts of the United States until imported in recent years by immigrants from Europe. It is comparatively frequent in Russia and Poland, in Holland and in Italy, and also in parts of France, such as Lyons, the North-west, and the Midi.

**Etiology.**—In 1837 Remak, a pupil of Schönlein of Zurich, proclaimed that the crusts of favus were composed of filaments of moulds, but the discovery did not lead him to suspect the vegetable origin of the disease. In 1839 Schönlein also demonstrated the vegetable nature of favic crusts, but failed to perceive the full significance of the fact, and it was reserved for Grüby, who was on the eve of discovering the crytogametic nature of the ringworms, to prove in 1841 that the fungus which he had independently found in favus lesions was the cause of the affection. In the following year he announced that he had succeeded in inoculating the human skin, and also the skin of lower animals, with the favus parasite. In 1845 Remak, guided by Link, the famous mycologist, separated the fungus from the genus Oidium, to which it had been assigned, created for it the genus Achorion, and named it the *Achorion schoenleinii* in honour of his master.

Further researches, however, shewed that the etiology of favus was a

less simple matter than had at first been understood. It appeared that more than one species of fungus, obviously different from *Achorion schoenleinii*, was concerned in the production of favus in the lower animals. Next it was established that favus in the mouse, due to a fungus different from two other animal parasites of favus that had been identified, as well as from *Achorion schoenleinii*, is communicable by inoculation to man. It was found also that in the cultures of the fungus of human favus from different cases there were differences which suggested that more than one species of parasite might be concerned in the production of favus in man. Quincke considered that he had isolated three different species of the achorion in human favus, but afterwards reduced the number to two. Unna, with Franck and afterwards with Neebe, distinguished as many as nine different species of the fungus. On the other hand, the unity of the human fungus has been maintained, among others, by Danielssen, Pick, Mibelli, Truffi, Jadassohn, Dubreuilh, Sabrazès, and Sabouraud. Bodin, one of the best authorities on animal ringworms, while recognising that man can be inoculated by favus parasites of animal origin, holds, as the results of researches in hundreds of cases, that favus of animal origin is excessively rare, and that *Achorion schoenleinii*, which is the cause of all but a negligible proportion of human favus, is not a genus but a single species, the differences in the cultures being due to the media employed or to pleomorphism. Atypical lesions are indeed met with, but they never correspond with differences in the parasite. Sabouraud testifies that in not one of the 200 cases of scalp favus which have come under his observation has he found any parasite but *Achorion schoenleinii*. The unity of human favus is now generally, though not universally, accepted; and it is not going too far to hold *Achorion schoenleinii* responsible for fully 99 per cent of the cases of favus in man.

FIG. 27.—Culture of *Achorion schoenleinii*, culture of 3 months. (Sabouraud.)

That favus can be communicated from animals to man, and from man to animals, is conclusively proved, though such transmission is extremely rare. Four animal species of achorion are enumerated, as follows:—(1) *Achorion quinckeanum* (Bodin, 1902); (2) *Achorion gallinae* (Mégnin-Sabrazès, 1890-93); (3) *Oöspora canina* (Sabrazès, 1893); (4) *Achorion gypseum* (Bodin, 1907). The first of these, the parasite of mice, was so named by Bodin under the impression that it had first been described by Quincke, but Sabouraud holds that the fungus was really discovered by Bodin. He points out that from the scalp of the patient from whose skin Quincke obtained the supposed achorion which yielded a white culture, had already been extracted a favus cup which gave a culture of *Achorion schoenleinii*, and that it is without precedent for the lesions of the same tinea patient to yield more than one parasite—except in ringworm schools, where there may be exchange of parasites between the patients. If Quincke's case be not accepted, the only human observations of this parasite in man are four—two by Bodin, who obtained one from a favus-

cup on the cheek of a patient living in a house infested with favus-affected mice, and two by Dr. H. G. Adamson, who when Sabouraud exhibited the cultures of *Achorion quinckeanum* at the Sheffield meeting of the British Medical Association in 1908, recognised them as precisely similar to cultures which he had obtained from a favus of the glabrous skin in a boy. Dr. Adamson's second case is more recent. *Achorion gallinae* and *Achorion caninum* have never appeared spontaneously in man, but have been successfully inoculated. *Achorion gypseum* has only been found five (possibly six) times in man and twice in animals. The position of this parasite is doubtful, for culturally it has affinities with pyogenetic trichophytons of the gypseum type, whilst mycologically it appears to be identical with animal microsporons. Between the achorions there are considerable cultural differences, and their relationship to each other is to be found rather in the lesions they produce than in their cultural characters. Sabouraud points out that the animal achorions, in the rare cases in which they have been met with in human favus, never attack the scalp.

Marked as are the clinical differences between the favus fungi on the one hand and the microsporons and trichophytons on the other hand, there are intimate resemblances between all the three groups morphologically, and, as Bodin points out, a truly scientific division will only be possible when their higher forms have been precisely determined. Matruchot and Dassonville, reasoning from analogy, consider that the fungus of human favus belongs, like the trichophytons and the microsporons, to the Gymnoasceae, but no classification can yet be regarded as more than provisional. The saprophytic origin of the achorion is considered by Bodin to be possible but exceptional.

Favus is less contagious than trichophytosis. It may be transmitted by direct contact, or through the medium of cloths, head-gear, and the like. It is a rural rather than an urban disease, and according to Darier, the cases that occur in Paris are nearly always imported from the provinces. Want of cleanliness and promiscuity of contact are the chief predisposing causes; and the fungus appears to find a favourable soil in the skins of persons of weak health, especially those suffering from phthisis.

**Signs and Symptoms.**—Favus shews a marked preference for the scalp, but no part of the skin is exempt, and even the mucous membrane may be attacked. The characteristic lesion, which, however, in rare cases is absent or cannot be distinguished, is a small sulphur-yellow disc or scutulum, with a cup-like depression in the centre, which is pierced by a hair. Both in colour and in shape it somewhat resembles a honeycomb: hence the designation *favus*. It appears first as a collection of white material, not unlike a pustule, which grows, and presently becomes dry and friable. The scutulum can then be lifted out of the epidermis, when a pimply, smooth, greasy surface is exposed. As they grow, the scutula often run together, individual discs being pressed into a more or less hexagonal shape. Later, rough, mortar-like crusts are formed. Between the crusts there are often irregular, pale bluish-pink scars. The lesions

are usually present in various stages of development at the same time, scutula, large crusty excrescences, and scars being intermingled. The disease is frequently complicated by pediculosis, and secondary lesions may arise by inoculation of pus cocci. Itching is generally present, but this may be due to pediculi. A more characteristic symptom is a peculiar mousy smell, caused by the fungus itself. The lesion generally takes several months to reach its full development, when the scab and scutulum come away, leaving a glistening atrophic pit, destitute of hair. In a case of generalised favus which came under my observation the whole scalp was covered with large patches of favus crusts. There were also crusts on the cheeks, and large surfaces on the back were occupied with similar masses. The nails of both hands and of both feet were thickened, uneven, and lustreless; in some of them no traces of true horny substance remained, its place being occupied all over the matrix and nail bed by an irregular, lumpy, dirty-yellowish crust. In a case reported by Kaposi a patient suffering from generalised favus died with symptoms of severe gastro-intestinal irritation, which was found after death to be due to the presence of the achorion in the stomach and intestine.

The cup-shape of the characteristic lesion is attributed by Unna to more rapid growth of the fungus at the sides than in the centre of the disc. The material of the scutulum, easily broken up into a greyish dust, is seen under the microscope to consist of abundant spores and of short tubes of mycelium. The spores vary much both in shape and size; some are round, others oval, others of irregular form. The segments of mycelium are from 4 to 15 $\mu$ in length, and from 3 to 7 $\mu$ in breadth. Both spores and mycelium are composed of granular protoplasm and a membranous substance. At the base of the cup are slender tubes of mycelium; above these are larger, sporulated tubes; on the surface are short particles of mycelium and spores; sometimes the whole lesion is covered by horny shreds of epidermis. The mycelium may penetrate beneath the disc into the mucous body of the epidermis, and may even reach the dermis, as is never observed in trichophytosis. This explains the inflammatory reaction in favus and the subsequent cicatrisation. Hairs affected with favus (Fig. 28) are discoloured and lustreless, but they do not break off as in ringworm. In them may be seen more or less numerous tubes, some squat and sporulated, others slender and more rectilinear; they consist of segments from 12 to 15 $\mu$ in length, dichotomised at an acute angle. In an affected nail the ungual cells are separated by irregular filaments, varying greatly in thickness, or by spores.

**Diagnosis.**—In well-marked cases, favus is easily recognised by the cup-like, sulphur-coloured scabs, the mousy odour, and the unbroken hairs. In less characteristic cases it can only be distinguished from ringworm by microscopical examination or by culture of the fungus (Fig. 27). All the lesions should be examined with a lens for remains of the yellow discs of favus or the broken hairs of ringworm. When the initial lesions have coalesced into dense crusts, favus may resemble

psoriasis of the scalp. The scales, however, are less pearly, and discs of sulphur-yellow scabs can often be seen about the edges; the lustreless hair and atrophic scarring are also distinctive features. From eczema and seborrhoea, favus is differentiated by its lesions not being diffuse, but always having a well-defined margin.

FIG. 28.—Hair in favus × 75. (Sabouraud.)

**Prognosis.**—If left untreated, favus is essentially chronic, and may persist for fifteen or twenty years, or longer. In rare cases, however, it comes to a standstill spontaneously, leaving a few bald spots. Sometimes it is extremely refractory to treatment. Like ringworm, it yields much more easily to remedial measures on the glabrous skin than in hairy regions.

**Treatment.**—The general lines of treatment are the same as in ringworm. The crusts should be removed by thorough soaking with carbolised oil, or, after softening them, by the curette, and tincture of iodide should then be applied. In favus of the scalp, epilation should be effected with *x*-rays and parasiticides vigorously rubbed in. If the nails are affected, avulsion may be necessary to allow free access of the parasiticidal agent. Zinsser has found the application of heat by means of Leiter's tubes very effective. Water at a temperature of 52-55° C. was passed through tubes placed over sublimate compresses. The appearance of fresh discs must be carefully watched for; and after apparent cure the patient must be kept under prolonged observation.

Hodara has succeeded in implanting healthy hairs, taken from the patients, in the scars left by favus. After making several incisions in the scar, close together and crossing each other, and washing till bleeding had completely ceased, he planted fragments of hair from 1 to 4 mm. in length; these were cut quite clear of the bulb and the epidermic cells, and trimmed with scissors so that their ends were perfectly level; the part was then covered with paper and plaster. In a month the dressing was removed; and though most of the implanted hairs came away with it, enough remained to form the starting-point of a growth sufficient to cover a large patch.

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TINEA VERSICOLOR.—This affection of the horny or superficial layer of the epidermis, characterised by the yellowish or brownish discoloration of the lesions, was at one time ranked with the group of pigmentary stains. It was distinguished from them by Willan, who placed it in the desquamative group of skin diseases, and styled it pityriasis versicolor, a designation which is still frequently used, especially by Continental dermatologists. The colour of the lesions is subject to great variation, not merely in different patients, but in different regions in the same patient, and even in the same patch; hence the specific name of the affection.

**Etiology.**—Tinea versicolor is caused by the *Microsporon furfur*, first described by Eichstedt, in 1846, and named by Ch. Robin. Of the mycology of this parasite little is known. Cultures have with difficulty been obtained by T. Spielschka and by Kottliar, and by Nicolle upon glycerinated agar. Köbner successfully inoculated himself, and infected animals. If a scale be removed from a patch by gentle scraping with a blunt spoon, which can be done quite easily, so superficial is the lesion, it will be found, after treatment with potash, to contain the parasite in abundance. The spores are rounded, have a double contour, with a diameter of 3-5 $\mu$, and are generally grouped together in masses resembling bunches of currants (Fig. 29); between the masses are short threads of mycelium, varying in diameter from 3 to 4 $\mu$, flexuous and sometimes U-shaped, but without ramifications. Like the spores, they have a double contour, and while some of them are continuous, others consist of several cylindrical segments, separated by transverse septa. The relation between spores and mycelium has not yet been determined.

Tinea versicolor is contagious, but only in a very low degree. The fungus requires a specially favourable soil and prolonged contact before it can take root. Profuse sweating prepares the soil to some extent, and phthisical subjects are specially liable to attack. Some have even suspected a relationship between *Microsporon furfur* and the tubercle

bacillus, but the coincidence is probably explained by the sweating, the habitual wearing of flannel, and the fear of ablutions, which are met with in tuberculous subjects. Tinea versicolor is rarely found in young children; it occurs chiefly in adolescents, and males are rather more vulnerable to attack than females.

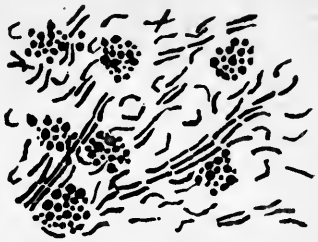

FIG. 29.—Elements of *Microsporon furfur*. (From Morris's *Diseases of the Skin*.)

**Signs and Symptoms.**—The lesions are roundish, scaly patches, very slightly raised, but with a well-defined border, scattered like islands, or massed together like irregular continents, and contrasting sharply in colour with the surrounding skin. The hue varies from fawn to liver; in those who have resided in warm climates it may be black, while in coloured races it is grey or white. The affection leaves the hair untouched, and also the hands and feet, and is generally limited to the trunk, of which it more often attacks the front than the back; but occasionally the upper parts of the limbs are invaded. It shews a predilection for the superior part of the chest, whence it may spread to the loins, the abdomen, the groins, the shoulders, the arms, and occasionally the legs. Very exceptionally it has been found to attack the neck and the chin (Unna). I have seen it in the face, and similar cases have been reported by Besnier, Payne, and Dubreuilh. There is no inflammatory reaction, except in persons who perspire profusely, when the lesions may be the seat of an eczematoid process. In these cases there may be intense itching; ordinarily, however, this symptom is not very prominent (*vide* Fig. 123).

**Diagnosis.**—The lesions offer some resemblance to the pigmentary patches sometimes met with in leprosy, and they have also been mistaken for secondary syphilides. The ease with which the scales can be detached by a stroke of the finger-nail is, as Darier remarks, almost pathognomonic. Examination of the scales with the microscope cannot fail to clear up any doubt that may be left.

**Prognosis.**—Untreated cases may persist indefinitely; but they usually end in spontaneous cure. I have known lesions quiet down in winter and appear again in the summer. Under treatment they soon disappear.

**Treatment.**—The affected part should first be thoroughly washed with soft soap and warm water, and afterwards rubbed with a flesh-brush, in order to remove the natural oiliness of the skin. These measures should be followed by the application of iodine, which not only effects a rapid cure, but by its staining power brings into relief small and ill-defined spots. If the odour of iodine prove objectionable, a solution of hyposulphite of sodium ʒij. to ℥j., or sulphurous acid, diluted to one-fourth with water, may be applied. For regions where the skin is delicate, such as the groins or the axillae, Darier recommends naphthol (1 in 30), sulphur (1 in 20), or salicylic acid ointment.

Castellani distinguishes several forms of tinea versicolor—a yellow (*flava*), a white (*alba*), and a black (*nigra*) form. The names he proposes for the parasites he reports as the causes of these varieties of the affection are respectively *Microsporum tropicum*, *M. macfadyeni*, and *M. mansoni*.

The same observer also reports a dermatomycosis which presents some resemblance to tinea versicolor and to tinea imbricata, but differs from the one in that the fungus is not found on the surface and that the epidermis is split, and from the other in that the eruption never develops in concentric rings. The name he proposes for the affection is tinea intersecta. The parasite exhibits the general characters of a trichophyton.

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Erythrasma.—Erythrasma, seldom met with in this country, but said by Darier to be as frequent as tinea versicolor, received its name from Bärensprung. It is an epidermomycosis presenting some points of resemblance to tinea versicolor, and characterised by brownish or yellowish-red, slightly scaly patches which usually appear in the genito-crural region. As in tinea versicolor, only the horny stratum of the epidermis is affected, nor is the hair attacked.

**Etiology.**—The exciting cause of the affection is the *Microsporon minutissimum*, discovered by Burchardt in 1859. The elements of the fungus are extremely small, like those of the streptothrix. It is seen in preparations as spores and as threads of mycelium, disposed almost the same as the elements of *Microsporon furfur*. The spores are dispersed among the filaments, or massed together, or disposed in little chains of which the elements are 0·6 $\mu$ in diameter (Fig. 30). The threads, long and flexuous, with the same diameter as the spores, are seldom ramified, and they are so abundant and so twined together as to form, in some places, a network over the epidermic cells. They are divided into segments placed end to end; and in preparations in which the scales have been crushed they appear either as more or less elongated bacilli or as cocci. De Michele claims to have grown a culture of the parasite, and to have produced in man, by inoculation, lesions analogous to those of erythrasma, and Bodin provisionally accepts the claim, in spite of the doubt thrown upon it by Ducrey and Reale. But the results obviously require confirmation; and the morphology of the parasite is not known.

Fig. 30.—Elements of *Microsporon minutissimum*. (From Morris's *Diseases of the Skin*.)

Erythrasma is contagious, but in a low degree. The media of infection are underclothing and the seats of water-closets. The

disease is never met with in children, and women are less liable than men.

**Signs and Symptoms.**—The advent of the disease is usually unnoticed. The only subjective symptom is a slight itching after perspiration. The lesions may be either unilateral or bilateral. Occasionally the axillae are attacked, and, in fat subjects, the abdominal and submammary folds and those of the large joints. The colour of the patches varies from time to time, and may be dark-red, tawny yellow, or brownish tinted with red. The surface is flat and scaly; during perspiration it becomes moist and greasy.

**Diagnosis.**—As a rule, erythrasma is easily identified. In rare cases it resembles one type of eczema marginatum, but it is distinguished from that affection by its low degree of contagiousness and its slow evolution. Microscopical examination will clear up any remaining doubt.

**Prognosis.**—Erythrasma is an affection which develops slowly, and may be of indefinite duration. The lesions quickly yield to appropriate treatment, but recurrence is frequent, and persistence after apparent cure is necessary.

**Treatment.**—This should follow the same lines as the treatment of tinea versicolor. Owing to the sensitiveness of the skin in the regions usually attacked, tincture of iodine, if used at all, must be well diluted. Darier advises painting with a solution of permanganate of potassium, 1 in 1000, or the application of sulphur, cade, or naphthol ointment.

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## Animal Parasites

The animal parasites that infest the skin of man have been divided into three classes. The *first* is made up of those which make their habitat almost exclusively in the human skin—among them the itch-mite (*Acarus* or *Sarcoptes scabiei hominis*); the pediculus or common louse, of which there are three varieties; the common flea (*Pulex irritans*); and the *Demodex* (or *Acarus*) *folliculorum hominis*. The *second* class consists of temporary or occasional parasites; they may be present either (*a*) in a sexually mature condition, like the bed-bug (*Acanthia lectularia*) and the bird-mite (*Dermanyssus avium*), or (*b*) in the larval form, such as cestodes (*e.g. Cysticercus cellulosae* and the echinococcus or bladder-worm), trematodes (*e.g.* the liver-fluke, *Fasciola hepatica*), nematodes (*e.g. Filaria medinensis, F. sanguinis hominis*, and *Oxyuris vermicularis*), and Muscidae (*e.g. Musca domestica, M. cadaverina, M. vomitoria*). The *third* group is formed by

accidental parasites, of which the most familiar example is the harvest-bug (*Leptus autumnalis*). The only affections due to animal parasites which need be dealt with here in detail are scabies, grain itch, and pediculosis.

SCABIES.—This affection was long regarded as a prurigo, and was treated by bleeding and depuratives. Mouffet was among the first, in 1634, to maintain that it was parasitic, but in the fourth decade of the nineteenth century it was still necessary for Renucci to demonstrate that the acarus was the exciting cause of the disease.

**Etiology.**—*Acarus* (or *Sarcoptes*) *scabiei hominis* is an insect belonging to the tracheal order of the Arachnida. The impregnated female acarus is the exciting cause of the affection. When impregnated she measures $\frac{1}{3}$ or $\frac{1}{4}$ mm., and can just be seen with the naked eye as a whitish opaque spot. She has a roundish body with eight conical legs; to each of the two anterior legs is attached a sucker, to each of the two posterior pairs a bristle. Having been impregnated she penetrates the horny layer head first, and wriggles through it, as she progresses leaving behind her the ova in the deeper epidermic structures. She thus makes a tortuous burrow, inhabiting the blind end of it for about two months, and depositing altogether about fifty eggs which measure 0·16 mm. by 0·10 mm. They are hatched in about a week, and aided by the exfoliation of the epidermis, the young make their way out of the burrow through orifices which shew as black punctures, to find another habitat. The male acarus, which does not dwell in the burrows, is only about half the size of the impregnated female, and can only be discovered with difficulty. It has a sucker on the posterior pair of legs. Scabies can only be caused by the entrance into the epidermis of an impregnated female acarus, and owing to the habits of the insect, it is almost always at night that contagion is effected. The bed-clothes or underclothing of subjects of scabies may possibly act as media of contagion, but usually it is only by prolonged and intimate contact between healthy and infected subjects that the affection can be conveyed. Want of cleanliness is a predisposing cause, but there is no immunity to the disease.

**Signs and Symptoms.**—These generally appear after a period of latency of about ten days, but in some cases as little as two days, in others as long as a month. At the point where the acarus first penetrates the epidermis—usually in the webs between the fingers or toes, on the fronts of the wrists, the ankle, the elbows, the breasts in women, the buttocks in children, the glans and the prepuce in men—there is generally a vesicle which marks the situation of the mouth of the burrow. In some cases the vesicle is abnormally large, and raises to the surface the adjacent part of the burrow, which can then be seen starting from within the vesicle. The burrow is usually from one-eighth to half an inch in length, but may be longer. It shews, especially in persons not regular in their ablutions, as a curved or sinuous black line, the colour being due partly to excrementitious matter which the acarus leaves behind her in

her progress, partly to dust and dirt. As a rule, especially at night, there is extremely troublesome itching, varying, however, greatly in degree, according to the temperament or sensitiveness of the patient. Not infrequently irritation is set up in parts remote from the seat of disease. Thus, having inoculated myself experimentally on the arm, I felt little or no itching at the site of the lesion, but presently became aware of intense itching at the back of the shoulder. This reflex irritation may cause a sympathetic eruption in remote parts, as in urticaria.

By the scratching which is usually provoked by scabies, and the inoculation with pus cocci, more or less severe secondary lesions are set up. At first vesicular, the eruption becomes pustular and bullous. Though not seldom presenting some resemblance to eczematous lesions, those of scabies are grouped differently, being isolated and scattered about irregularly. As a rule, they are most in evidence in parts subjected to friction, and over the ischial tuberosities in those who have to sit long on hard seats. In rare instances—less rare, however, in Norway and elsewhere than in England—they may be so severe as to disguise the real nature of the affection. In severe cases burrows, vesicles, bullae, and pustules are mingled with excoriations, and with the effects of secondary inoculations in the form of impetiginous or ecthymatous lesions in all stages of development.

**Diagnosis.**—In well-marked cases scabies is quite easy of recognition. Its "note" is the burrow, and if this can be distinguished the parasite must be sought. A pin laid flat on the surface should be pushed with a rotatory movement into the epidermis at the end of the burrow away from the vesicle, care being taken not to draw blood. If the acarus be alive it will cling to the point of the pin, and having been extracted it can be mounted in glycerin and examined under a microscope. If no burrow can be detected, reliance must be placed upon the irregular disposition and multiformity of the lesions, the nocturnal itching, and the high degree of contagiousness. A pustular eruption on the hands should always excite suspicion. In persons of cleanly habits it may be impossible to detect the burrow in parts that are frequently washed—say, the hands, especially when the parasite has only just entered the epidermis, or when the burrow has been opened up by scratching or by treatment, and it may be necessary to make a minute inspection of such parts as the umbilicus and the penis. Darier draws attention to the effects of acarophobia in those who have heard about scabies or who have suffered from it, and considers that when, after the classical St. Louis treatment (see p. 156), itching or eczematous irritation persists, it is better, in the absence of new burrows, to prescribe baths and soothing applications than to recommence the treatment.

**Prognosis.**—If proper treatment is submitted to, a cure may be expected. But with nervous subjects scabies may lead to marasmus, as a result of the intense itching and the consequent insomnia. Not uncommonly albuminuria is met with in association with scabies; whether it is due to toxins of the acarus or to the micro-organisms that set up the

secondary lesions, or to the ointment—such as balsam of Peru—employed in the treatment, is not known. In persons with an exceptionally sensitive skin, scabies may be the starting-point of eczema and other dermatoses.

**Treatment.**—The indications are four—(1) the breaking-up of the burrows; (2) the destruction of the parasites; (3) the relief of the subjective symptoms; and (4) the prevention or cure of the secondary lesions. In ordinary cases the parasiticidal agent should be employed with vigour, but care must always be exercised not to push the treatment far enough to stir up an acute dermatitis. The lesions having been soaked with hot water and vigorously scrubbed with soft soap, a parasiticidal ointment, or, better, paste, should be thoroughly rubbed in and plastered over the affected parts. The usual application is simple sulphur ointment (℥ss. to ℥j.). It should be renewed every few hours for two or three days, and a cleansing bath then taken, the patient's clothes having meanwhile been disinfected by boiling or by fumigation with sulphur. Another effective ointment, suitable for cases in which there is much inflammation, is composed of sulph. sublimat., olei cadini āā ℥ij., cret. preparat. ℥ijss., saponis virid. and adip. āā ℥j. A much milder ointment, which has little odour, and is white, is naphthol ℥ss., cret. preparat. ℥iij., saponis virid. ℥jss., adip. purific. ℥iij. The first and second indications for treatment are very rapidly fulfilled by the application of Vlemingkx's lotion—quicklime ℥ij., sulphur ℥iv., water ℥xx., boiled in an iron vessel, and stirred with a wooden spatula. By causing exfoliation of the epidermis the quicklime gives the sulphur free access to the burrows. Max Joseph uses Kaposi's ointment—$\beta$-naphthol, cret. albae āā 10, saponis virid. 50, axungiae porci 100 parts. If this fails he resorts to Hebra's modification of Wilkinson's ointment—florum sulphuris, olei fagi, saponis virid. āā 40, axungiae porci, pulv. cretae albae āā 80 parts. The treatment at the St. Louis Hospital, Paris—*la frotte*—begins with rubbing the whole body energetically with soft soap for from twenty to thirty minutes and continuing the friction in a warm bath for a further period of an hour, so as effectually to open the burrows. The body is then rubbed with an ointment consisting of potass. carbonat. ℥j., sulph. sublimat. ℥ij., in 1½ ounces of lard. The ointment is left on until the next day, when a bath is administered. For pregnant women, children of tender years, and patients with very sensitive skin or who are the subjects of serious inflammatory dermatoses, sulphur is too powerful a remedy. In such cases balsam of Peru, which is more rapidly fatal to the itch-mite than sulphur, may be used. It is painted over the whole surface of the body, and allowed to remain until the next day, longer if necessary. Peruol, an extract prepared from the balsam, is without the offensive smell of the latter drug; Juliusberg uses a 25 per cent solution in olive oil. Stavesacre, or weak balsam of Peru ointment, is serviceable in these cases. The itching may be relieved by calamine lotion, or alkaline baths with carbolic or menthol soap.

The secondary lesions must be treated with antiseptic applications,

such as boric-acid lotion or liquor carbonis detergens. When they are of great severity, the inflammatory symptoms must be first subdued, parasiticides then being cautiously applied in gradually increasing strength.

**Scabies of Animal Origin.**—The commonest form of scabies of animal origin is that known as Norwegian itch, which has been met with by Danielssen and Böck in Norway in lepers, and also in Germany and other countries. Darier's opinion is that this is not simply a chronic form of scabies, but is due to a special variety of the parasite, perhaps, as Mégnin maintains, the acarus of the wolf. The primary lesions are followed by thick and prominent scabs, which may spread over the whole body, including the face and the back. In other and rarer forms of scabies characterised by a diffuse miliary or multiform pruriginous eruption, the parasite may be derived from the cat, the dog, the sheep, and other animals, including birds. As a rule they are easily cured. The worst of them is equine itch, of which Darier has met with an example almost identical with the one reported by Besnier and Mégnin in 1892. The clinical picture was that of a generalised pityriasis rubra; and the acarus was found by thousands in the scales and scabs.

**Grain Itch.**—In the year 1901 a new disease appeared in epidemic form in Philadelphia, called by J. F. Schamberg, who has described it, grain itch (acaro-dermatitis urticarioides). Cases of the same character have since been encountered in that city, usually between the month of May and the beginning of October, and in the spring of 1909 the disease was prevalent in Philadelphia and neighbouring towns.

*Etiology.*—In practically every instance the affection was traced to the use or handling of a new straw mattress. Close inspection of the siftings of the straw disclosed the presence of a minute acarus which was closely allied to, or identical with, the *Pediculoides ventricosus.*

*Symptoms.*—The disease is characterised by an eruption of wheals, many of them capped by a vesicle the contents of which, at first clear, speedily become purulent. Instead of wheals, the efflorescence may consist of barely elevated erythemato-urticarial spots or papulo-urticarial lesions. The eruption varies in extent; it is usually profuse, affecting the neck, chest, abdomen, and back, and to a lesser degree the arms and legs. The trunk is chiefly attacked, the face often free, and the hands and feet are nearly always exempt. The eruption is usually accompanied by intolerable itching, which is worse at night, and seriously interferes with sleep.

*Treatment.*—Schamberg used with excellent results an ointment composed of $\beta$-naphthol gr. xxx., sulphur. praecip. gr. xl., adipis benzoat. $\bar{3}$i. This not only destroyed the mites, but also relieved the cutaneous symptoms.

In this connexion reference may be made to a series of cases of "barley itch" described by Dr. W. Kenneth Wills as occurring in some fifteen grain-porters who had unloaded a cargo of barley coming from Casa Blanca, West Africa. A profuse, rose-coloured papular eruption of an urticarial nature was present mainly on the chest and abdomen, but

also on the neck, face, arms, forearms, shoulders, and there were a few lesions on the back and legs. On compression a droplet of serum exuded from some of the papules, and on examination with a lens a tiny black dot was detected in several of the papules. These dots proved to be minute lance-pointed hairs with a fractured proximal end and an air-containing medulla. Dr. Wills came to the conclusion that the lesions were due to vegetable hairs in the barley. Acari were found by an expert who was consulted, but were so macerated that he was unable to identify them.

PEDICULOSIS.—**Etiology.**—Phthiriasis, or pediculosis, is due to the presence of lice which may infest the head, the body, or the pubic hairs. They are insects belonging to the order Aptera, of the family Pediculus. The pyriform head is furnished with mandibles with which the skin is seized, and a membranous sucker which is thrust into the opening of a sweat duct; to the thorax are attached six legs, each ending in a mobile hook. The eggs or nits which the females deposit are surrounded by a chitinous envelope. They are deposited on the hairs, one being firmly attached to a single hair by a glutinous substance. The young do not undergo any metamorphosis after being hatched.

The lice infesting the three localities specified differ somewhat in size and form. The head-louse (*Pediculus capitis*) has a triangular head, and its colour is determined by that of the skin it feeds upon; in Europe it is grey, with black margins to the segments of the abdomen. It especially frequents the hair of the heads of neglected children of both sexes, and of uncleanly women, and sometimes the beards of men. Multiplication is rapid, each female laying from fifty to sixty eggs. The body-louse (*Pediculus vestimenti*), the longest of the three species, has a more oval-shaped head and more developed legs, and is more active; in colour it is dirty-white, with black margins. It finds its habitat in clothing, especially underclothing, and attacks adults and the old more than children. Its fecundity is enormous; two impregnated females, according to Leeuwenhoek, being capable of producing, in two months, a progeny of 18,000. *Phthirius inguinalis* or *Pediculus pubis* is broader and flatter than either of the others, and has a certain resemblance to the crab: hence its common name of crab-louse. In colour it is yellowish-brown, and its rounded head has five prominent antennae. The female lays from ten to fifteen eggs, which hatch out in a week, the young attaining sexual maturity in a fortnight. The parasite dwells chiefly among the pubic hairs, but may wander to the abdomen, the thorax, the axillae, and occasionally even to the eyelashes, whiskers, and beard. Usually communicated in sexual intercourse, it is sometimes derived from clothes; persons of cleanly habits may easily become the hosts of the parasite if they put themselves in its way.

**Signs and Symptoms.**—The lesions caused by the three species of parasite are similar, though modified, of course, by peculiarities of situation.

When the louse has satisfied its appetite it withdraws its sucker, and the blood welling up in the duct forms a tiny red spot on the surface. This primary lesion, visible but not tangible, is, as Tilbury Fox first pointed out, the characteristic lesion of pediculosis, and its presence is conclusive. The only other lesions are the excoriations, wheals, and pustules caused by scratching; these, if they are persistent, may produce a peculiar leathery thickening of the skin with pigmentation — the so-called "vagabond's skin" seen in tramps. This condition, as Darier says, is sometimes met with in the buccal mucous membrane, which shews that it cannot be due solely to the scratching. In pediculosis pubis blue or dark specks appear on the abdomen, the thighs, and the loins, and the papular eruption is sometimes complicated by eczematoid inflammation. The pyrexia occasionally found in connexion with pediculosis may possibly arise reflexly from cutaneous irritation, or may be the result of a kind of poisoning.

**Diagnosis.**—In all three forms of pediculosis the presence of the parasite, or of the nits, when detected, is sufficient to establish the true nature of the affection. When impetigo contagiosa is present in association with itching of the scalp, especially if there is enlargement of glands in the neck, the occipital region should be carefully explored for nits. When the melanodermia has extended to the mouth, pediculosis corporis must be distinguished from Addison's disease, in which oral pigmentation is a characteristic sign. This is not difficult, for itching is not a feature of Addison's disease, and the pigmentation is differently distributed. From scabies, pediculosis of the body is differentiated by the absence, in the latter affection, of lesions on the hands and wrists.

**Treatment.**—In all cases of pediculosis, whether of the head, of the body, or of the pubes, the obvious indication is to destroy the parasites. In pediculosis of the *head* in children the hair should be cut short, and white precipitate ointment applied; in women the scalp may be thoroughly smeared with this preparation without the hair being shorn. To get rid of the nits, the hair, having been wetted with acetic acid to dissolve the glutinous material, should be carefully combed out as often as may be necessary. Another remedy is a mixture of ether ℥j. and oleate of mercury (5· per cent) ℥j. The pediculi and the ova having been destroyed, the crusts, softened with carbolised oil, should be detached, and the impetigo contagiosa treated with weak mercurial lotion, strong lotion of boric acid, or with balsam of Peru. In pediculosis of the *body*, the clothes should be baked in an oven at a temperature of at least 212° F., and the patient put into a hot bath and vigorously washed with medicated antiseptic soap. In *pubic* pediculosis, white precipitate ointment should be applied, or a mixture of oleate of mercury (5 per cent) ℥vj. and aether. sulph. ℥ij., followed by calamine or some other soothing ointment. The pubic hair need not be cut. When the eyelashes are involved, Janvier advises that the parasites be picked off one by one with tweezers.

**Miscellaneous Parasites.**—The flea (*Pulex irritans*) marks its presence

by a small red spot with a central darker spot. In febrile patients bites may be mistaken for the exanthem of enteric fever, of measles, or for purpura. The flea-marks on the linen and the dark centre of the punctures will shew the true nature of the lesion.

The *bug* (*Acanthia lectularia*) produces a wheal with a whitish centre and a central point. The application of linen soaked in eau de Cologne, toilet vinegar, lead lotion, or "Eau de Luce" (spirit. ammon. aromat.) relieves the irritation and hyperaemia caused by the irritant substance which the parasite injects in order to increase the supply of blood available for sucking.

The bite of the *harvest-bug* (*Leptus autumnalis*) causes bright-red papules and wheals, generally but not exclusively on the ankles and legs, leading to acute itching. Naphthol, or weak mercurial ointment, or some other parasiticide should be applied. The bites and stings of *gnats*, *mosquitos*, and similar pests may be treated in the same way. Eruptions are sometimes caused by the larvae of arachnida, pigeon-lice, etc., but they do not present any characteristic features.

In tropical countries the *chigoe* or *jigger*, a sand-flea (*Pulex penetrans*), frequently bores through the skin and gives rise to suppuration and ulceration. It should be extracted with a needle.

The *guinea-worm* (*Filaria medinensis*) gains admission to the body—it is believed in drinking-water—and then bores its way out through the skin. Emly, a surgeon in the French Navy, injects the parasite, if it protrudes, with a solution of perchloride of mercury, and having thus destroyed it, extracts it without difficulty after an interval of twenty-four hours. If there is no protrusion, the solution is injected as near the coiled-up worm as possible, and when it has been killed, it is cut down upon and extracted, or left to be absorbed (*vide* also Vol. II. Part II. p. 921).

*Craw-craw* is a papular and pustular disease met with on the west coast of Africa; it somewhat resembles scabies, and is caused by a filariform parasite (*vide* also Vol. II. Part II. p. 759). A similar affection is the *veld sore* of South Africa, associated with the presence of a diplococcus which Mr. Harman names *Micrococcus vesicans* (*vide* also Vol. II. Part II. p. 743). The sore, of which the surface of the upper limbs, from elbow to digits, is the usual site, is generally a sequel of abrasions, though it may follow insect-bites or exposure to the sun. It should be treated by free removal of the superficial epidermis in the neighbourhood of the sore, rubbing the ulcerated surface with lint soaked in a 1 in 1000 solution of perchloride of mercury, and dressing it with the same solution.

In tropical America and Brazil painful tumefactions are caused in the skin, both of man and of some lower animals, by the *Dermatobia noxialis* and other dermatobias, which deposit their eggs on the surface of the skin. The parasite has been described by Emilio Costo, who also gives an account of a dermatosis set up by another parasite, *Sarcopsylla penetrans*, which in 1872 was imported from tropical America into Africa and

thence into India and Madagascar. The female penetrates the skin, usually at the foot, and remains until, having discharged her eggs, which fall to the ground, she is expelled with the products of suppuration.

*Echinococcus hydatid* (Vol. II. Part II. p. 976), embryos of *Fasciola hepatica* (Vol. II. Part II. p. 853), and ova of *Bilharzia haematobia* (*Schistosomum haematobium*) (Vol. II. Part II. p. 864) have also been found in the human skin, and *Cysticercus cellulosae* in the subcutaneous tissue (Vol. II. Part II. p. 839). For an account of these parasites and their effects the reader is referred to Vol. II. Part II. of this work.

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# DERMATOSES OF STREPTOCOCCIC ORIGIN

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INTRODUCTION.—The well-defined natural group of streptococci is of the highest importance in medicine and surgery, and one of the greatest advances made in dermatology is the modern recognition of the notable part taken by this microbe in skin eruptions. The name streptococcus is derived from the special mode of division to form chains, though they are often found as cocci and diplococci. They are met with in human beings both in health and disease. They occur in sewage and in the air in London probably from contamination by horse-dung. The fluid in the healthy human mouth contains myriads of these organisms (*S. salivarius*), and the intestine also furnishes a multitude of another variety (*S. faecalis*). These cocci are well-established saprophytes, but in certain circumstances they probably become pathogenetic. The surface of the skin does not seem to be a favourite resort, and although streptococci are sometimes found, they are altogether outnumbered by staphylococci. After the discovery of the streptococci a number of different species were described, but later the difficulty of distinguishing them on morphological grounds alone was recognised. Dr. M. H. Gordon's recent researches on

their metabolic reactions have opened up a new test for classification, and Drs. Andrewes and Horder recognise seven types with sub-types and variants, namely, *S. equinus* of horse-dung; *S. salivarius* of the mouth and intestine; *S. faecalis* of the intestine; *S. mitis* of the saliva and faeces; *S. anginosus*, the pathogenetic organism of sore throat; *S. pyogenes*, the pathogenetic organism of erysipelas; and, lastly, the pneumococcus. The time is now ripe for a research on the forms of this microbe pathogenetic in the skin. Meanwhile it seems to be indistinguishable from *Streptococcus pyogenes*. There appears to be much variation in the virulence of pathogenetic streptococci.

I. **Cutaneous Streptococcic Lesions in the Course of Grave Systemic Infections.**—The skin may be involved with other parts of the body in such infections (septicaemia and pyaemia), but this is not the place to discuss the matter in detail. It may, however, be of interest to mention some of the types of lesion recorded.

Unna, under the title *Phlyctenosis streptogenes*, described a generalised eruption, at first papulo-vesicular and later varioliform, occurring in a one-year-old infant after measles, and terminating fatally on the fifth day. The necropsy disclosed lesions of a general infection with plugs of cocci in the papillary vessels of the skin and pustules becoming full of them. Hanot and Luzet recorded a streptococcic purpura with phlyctenae evolving in the taches in the course of a cerebrospinal meningitis in a woman aged twenty-two years. Purpura may be caused by streptococcic toxins. Finger observed a case of streptococcic *dermatitis pyaemica haemorrhagica*. Sabouraud and Orillard published a case with a general eruption of lesions simulating erythema nodosum due to a streptococcic thrombosis of enormously dilated veins of the skin in a systemic infection. Suppurating diffuse phlegmons are well known, and Mr. Lenthal Cheatle published a striking example of their successive formation. Erythema multiforme, like purpura, may be caused, but these eruptions are not special to any one infection or toxaemia. Widal and Thérèse, however, described an erythema haemorrhagicum from streptococcic emboli.

II. **Primary Lesions caused by deep Infection of the Hypoderm or Subcutaneous Tissues by Infection through the Skin.**—The lymphatics may be invaded, and from deep extension purulent thrombo-phlebitis and systemic infection may result. This organism is the habitual agent of diffuse phlegmons, and may be introduced through the skin. Erysipelas is a well-known form of infection, happily less common than formerly; it may suppurate without the aid of other organisms. The researches of Achalme and Sabouraud prove that recurrent streptococcic lymphangitis and consequent oedema of the lower limb may end in the so-called *Elephantiasis nostras*, usually starting from an ulcer of the leg. Sabouraud also says that some cases of so-called spontaneous or fulminating gangrene, of the scrotum, for example, are really erysipelas. It is a moist gangrene arising with the functional and general symptoms of a phlegmon and mortifying in some days.

III. **Primary Cutaneous Lesions.**—Streptococcic eruptions are very

common, and assume many different phases, but with a generic character, probably as the result of varying influences, such as the degree of virulence, the different site and depth involved, the resistance of the tissues, and possibly polymicrobism and climate. It seems that the cocci can penetrate the skin even in the absence of any injury to the surface. In this category we shall discuss the common impetigo contagiosa, ecthyma, vacciniform ecthyma, furfuraceous impetigo, post-auricular pseudo-eczema, perlèche or the erosions at the commissures of the mouth, so-called pemphigus neonatorum, von Ritter's disease, pemphigus contagiosus of hot climates, intertrigo, simple infantile dermatitis of Jacquet, paronychia, and a face oedema. Audry of Toulouse has observed a case and Winternitz 2 cases of highly inflammatory nodules on the hands of milkers, and

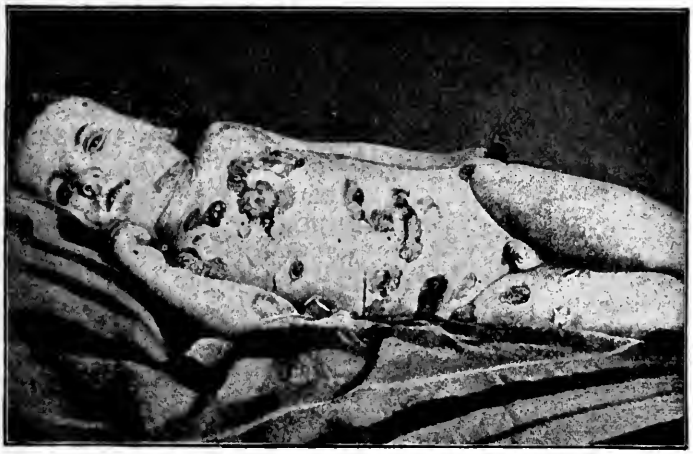

FIG. 31.—Pemphigoid varicella.

sometimes elsewhere. Winternitz cultivated a diplo-streptococcus which was not pathogenetic to rabbits or guinea-pigs.

It will be noted that streptococcic lesions may be exclusively epidermic, as in impetigo contagiosa, with serous exudation, or dermic as in erysipelas, or deeper-seated as in phlegmons and lymphangitis, and then suppuration is apt to occur.

IV. **Secondary Streptococcic Infections of the Skin.**—These are probably of great frequency and importance, and include what Sabouraud has described as *impetiginisation* or the secondary action of streptococci when engrafted on other eruptions, especially eczema. It is the symptom, he says, characteristic of impetigo when they come to be superadded, not by isolated points but diffusely, on a previous dermatosis free until then from impetiginisation and outside its proper symptoms and individual existence. Impetiginisation may complicate many dermatoses, such as burns, lupus, tuberculous ulcers, tertiary syphilides, cancroids, favus, prurigo, and vesicular eczema. The form and extent will correspond

with the primary dermatosis or be diffuse. The streptococci cannot form phlyctenae on the injured skin without its cuticle, but will cause abundant exudation and tend to form light crusts. The impetiginisation of occupation-dermatitides, or so-called eczema, so often seen on the backs of the fingers and hands, is a good example.

Another very interesting group of secondary infections is that of small-pox and chicken-pox. In small-pox the secondary streptococcic infection is evidenced not only by the formation round the crust of an eccentrically spreading phlyctenisation, but by fresh bullae. Certain cases also of chicken-pox are described as pemphigoid varicella or varicella bullosa. So far as my experience goes, these are probably due to secondary streptococcic infections; and Bolognini in 1897 found staphylococci and a few streptococci in an outbreak of 15 cases of chicken-pox, and in 12 just as the lesions were drying up they increased in size and formed bullae. It should also be noted that in some of the cases the eruption has been impetigo contagiosa from the start. In such an eruption as that due to scabies, phlyctenae may be seen. Sir J. Hutchinson mentions bullae the size of a bean or of a hazel-nut in scabies, and Hilton Fagge saw a case with a bulla as big as a hen's egg.

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IMPETIGO CONTAGIOSA (Tilbury Fox). — SYN.: *Impetigo phlyctenodes* (E. Wilson); *Impetigo vulgaris* (Unna); *Streptococcic impetigo; Impetigo* of French writers.

**History of the Name Impetigo.**—As great confusion has existed in the use of this word it will, perhaps, be useful to discuss the matter. Willan distinguished in his order *Pustulae* a group of eruptions under the generic term *Porrigo* from another group of pustular and scabbing eruptions denominated *Impetigo*. The varieties of the latter, namely, impetigo figurata, sparsa, scabida, and erysipelatoides, were gradually brought into relation with eczema, and the seal on this was set by Hebra. So, too, the heterogeneous group porrigo was effaced; porrigo larvalis and porrigo furfuracea were absorbed in eczema, porrigo scatulata is now known as dermatophytic eczema, porrigo lupinosa as favus, and porrigo decalvans as alopecia areata. One variety remained as a distinct disease with some English writers, namely, the porrigo favosa of Willan and A. T. Thompson, or impetigo favosa, as Bateman preferred to call it; but this name caused considerable confusion with favus. The contagious nature

was illustrated by Bateman, who declared the discharge both auto-inoculable and contagious, and by Plumbe, who recorded family outbreaks and inoculation from a child to its mother's breasts. In 1846 Startin recognised an eruption by the name porrigo simplex; and Sir Jonathan Hutchinson said it was also known as porrigo contagiosa, and illustrated it in the New Sydenham Society's Atlas. They considered, as did others, such as J. F. Payne long afterwards, that the eruption was due to the transplantation of pus cells from one part to another, and that it might arise from any cause leading to suppuration. Then came the writings of Tilbury Fox in 1863-64-69, which attracted world-wide attention, and the contagious eruption which he described as impetigo contagiosa is now generally accepted as a special streptococcic phlyctenular one, quite distinct from the pustular staphylococcic peri-folliculitis known as Bockhart's impetigo. But we know that the streptococci in certain sites can be pyogenetic, and it is difficult to decide if the gradual onset of pus formation in streptococcic phlyctenae is entirely due to secondary staphylococci.

**Etiology.**—The efficient cause is the infection of the superficial epidermis by streptococci—a streptomycosis. The characteristic effect in the skin is the exudation of serum to form phlyctenae, but in some cases, especially those originating from the attacks of pediculi capitis, the lesions appear to be vesiculo-pustular, and suggest a mixed infection of streptococci and staphylococci, though puriform contents are often due to secondary staphylococci. The eruption is contagious, often highly so, in the sense that it may be inoculated from an outside source or from others, or spread by auto-inoculation, as proved clinically and experimentally. It may be conveyed directly from one person to others, or indirectly by contaminated linen, towels, football jerseys, and so on. Thus, in addition to sporadic cases, outbreaks are met with in families, schools, and other institutions, flats, streets, and barracks. J. C. White has described it in immigrants. It may occur in any class, but especially in crowded dwellings and insanitary surroundings. The source which originates the eruption is some prior streptococcic infection, and it is readily traced to the eruption produced by pediculi capitis, to wounds such as those left by improperly healed vaccine pustules and to catarrhs of mucous membranes, on which J. F. Payne insisted so strongly. It occurs at any age, but is far more common in children for several reasons.

**Pathology.**—The phlyctena of streptococcic origin is formed by a serous effusion between the stratum granulosum and the stratum corneum, which contains nuclei of dead leucocytes mixed with living ones, mostly imprisoned in a fibrinous meshwork. The subjacent epidermis is somewhat oedematous, the papillary layer congested, and the papillary vessels somewhat engorged. The primitive crust, according to Sabouraud, has an upper layer of corneous cells sometimes with spongiosis. The bulk of the crust is composed of coagulated serum containing leucocytic nuclei in varying number. The microbic flora of the crust may be

abundant and variable. Staphylococci may be seen beneath the corneous layer, streptococci in most parts of the crust of serous formation, and Sabouraud and Gilchrist found a fine bacillus. Sabouraud makes the following remarks. In the early stages an extemporaneous preparation may not disclose microbes or diplococci, or rare chains may be obtained from the under surface of the roof in the fibrinous layer. Culture is more satisfactory but needs a special technique. He takes up in a pipette the serous contents of an early phlyctena, adds 1 c.c. of neutral peptone bouillon and a similar quantity of serum. The sealed tube is placed in a stove at 37° C., and next day a drop from the pipette shews an abundant culture of streptococcus. In the pipette the culture has the aspect of a sero-fibrinous clot, and the medium remains limpid. From a puriform bleb a drop only should be taken, for there are masses of staphylococci mixed with the streptococcic chains. From the crust a comparatively large quantity should be placed in the medium.

The history of this subject is very instructive. Although chains had been observed in England by Crocker (1881) and J. F. Payne (1883), the general opinion, formed from the culture methods used, was in favour of a staphylococcic causation. In 1891 Radice and P. de Michele found, as Rosenbach and Cordua were reported to have done, a streptococcus in *panaris sous-épidermique ou phlycténoïde*. Cultures injected into the skin cause a local bulla, but not a general infection. Charles Leroux, and later with Daum, found micrococci, diplococci, and hair chains in vesicles, and by using bouillon media a streptococcus in chains was cultivated, and declared to be the efficient cause when a re-inoculation of the pure culture excited the lesion. The staphylococci were secondary elements. This conclusion was confirmed by Kurth, and in 1896 by Brocher, who found the organisms fatal to inoculated mice, from whose blood he recovered the microbe. This experiment was repeated by Gilchrist in 1899, who found the virulence comparatively feeble, as the inoculated mice were only killed in seven to ten days. An injection of 100 c.c. of a bouillon culture twenty-fours hours old into the ear vein of a rabbit did not prove fatal. In 1897 Balzer and Griffon confirmed these conclusions, and also insisted on the special method of culture. Kaufmann also deserves notice for his work in differentiating the streptococcic and staphylococcic lesions. Then in 1900 onwards came Sabouraud's work, which has been of immense interest. At the present time the question is settled, and the isolation and culture of streptococci in the lesion under discussion have become a recognised part of dermatological work.

**Symptoms.**—This eruption, which is not ushered in or accompanied by constitutional disturbance, varies widely in extent and severity. A very common phase, most frequently seen on the face, generally comes under observation as a collection of friable amber crusts, looking as if "stuck-on," sparse or in more or less profusion, disseminated or crowded, or more or less confluent. Careful observation will usually disclose the earlier stages of the eruption. The elementary lesion is a transient con-

gestion, often obscured by the rapid exudation of serum which forms a phlyctena, in size from a vesicle to a moderate-sized bulla, seated beneath the cuticle, and generally flaccid and containing at first clear serum. This eruption is not essentially connected with the follicles. The discomfort and slight itching induce rubbing and scratching, and consequent rupture of the thin roof of the blister, whereon serum freely exudes and coagulates into a characteristic crust which is more durable. Under this crust a greyish fibrinous layer forms, and under this the cuticle reforms without scarring. If, on the other hand, the phlyctena remains intact, the contents frequently, but not necessarily, become puriform from the secondary staphylococcic infection, and correspondingly thicker and deeper-coloured crusts eventually result. When the bullae remain for a time unruptured the picture is different from the scabbed one. Another characteristic feature is the tendency to eccentric spread in these phlyctenae. The tendency varies much, as will be seen in the description of impetigo circinata and the so-called pemphigus neonatorum. In the phase we are describing the tendency also varies, but there is often around the crusts or excoriated macules a fringe of cuticle undermined by serous exudation. It is often described as exfoliation, which is not quite correct. The evolution of the lesions is successive, and the eruption may continue for an indefinite period. Though the face is a specially favourite site, any other region may be attacked, separately or in addition to the face. The experienced observer recognises these special phlyctenae localised, isolated, or grouped. The hands are frequently inoculated, and the folds of the nails, and the ankles and feet may be affected. The arms and legs and even the trunk may be attacked. There are other variations in the picture to be noted. Thus, the tendency to eccentric spread may be unusually well marked, and a large proportion of the lesions, which may be generalised, reach a considerable size, and may be confluent and form gyrate patterns. In such cases the serous exudation appears less marked, and the centre dries up as the process of undermining of the cuticle extends. This phase is known as impetigo circinata. Another phase is brought about by the formation of well-filled pemphigus-like bullae (impetigo bullosa) as depicted in Tilbury Fox's Atlas. When such bullae are generalised the picture may be very like true pemphigus (pemphigoid impetigo). Thus, under the name *Pemphigus contagiosus* Sir Patrick Manson described a contagious bullous eruption in children and adults, probably endemic in the Malay Archipelago, and epidemic in South China and probably in neighbouring countries with a similar climate; appearing during the damp hot months of the south-west monsoon. It frequently attacked Europeans and Eurasians in South China, but not the pure Chinese. Sir P. Manson described two forms which often coexisted: one more common in infants and young children, and generally scattered over the body; the other curiously localised to the back of the axillary region. A case of the first form is described as commencing with an eruption, thought by the mother to be chicken-pox, but becoming bullous with clear contents at first; the denuded area left after rupture was surrounded

by an eccentrically spreading exfoliation. This scattered form is easily cured, and may attack all parts except the scalp, even the palms and soles in adults. Lesions are transferable by the fingers, and where the cutaneous areas are contiguous a confluent raw surface is formed. The second form was characterised by the evolution of bullae in the adult on the posterior and upper part of the brachial wall of the axilla; these blebs also have an eccentric spread. Sir P. Manson experimentally inoculated with success his own arm, and, with their permission, the arms of healthy people and of some already with the eruption. This eruption occurred in families, schools, and probably barracks. After several weeks, the large lesions gave place to small vesicles and papules, as Dr. Adamson has observed in impetigo contagiosa in this country. Sir P. Manson found innumerable cocci, single or in groups, with pus cells. He pointed out the differences from true pemphigus by its contagiousness, its location purely in the skin, and easy cure. He admitted that it had many features in common with the description of impetigo contagiosa, but he gave up this diagnosis in deference to Tilbury Fox's erroneous statement that constitutional disturbance ushered in the eruption of impetigo contagiosa, but there can be little doubt I think that Sir P. Manson was dealing with this streptococcic affection. Similar eruptions have since been described in hot countries; a very interesting outbreak was recorded by Corlett in America under the name *Impetigo contagiosa bullosa*. This outbreak started amongst troops from the northern states quartered in Florida during the Spanish war, where the eruption appears to be endemic; it was carried back by the troops on their return home. In most instances there was an initial lesion from which the eruption seemed to spread. At first there were one or more small reddish spots from a pin's-head to a split pea in size, without fever or marked itching, attacking both robust and debilitated subjects. The red spots became vesiculated, and enlarged to the size of a finger-nail to 2 to 5 centimetres in diameter. Then bullae, which appeared to arise from sound skin, formed; later these bullae became flaccid, and were specially apt to extend peripherally, and after rupture to leave a margin elevated by a little serum and prone to extend. Sometimes light friable crusts or scales formed. The initial lesions usually began on the face or hands, and

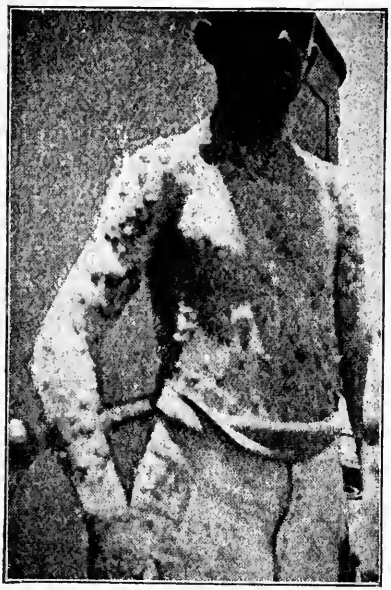

FIG. 32.—Impetigo contagiosa bullosa. (Corlett.)

spread to the axillae, and more extensively over the body and limbs, but in some cases they were localised. Cultures shewed staphylococci, as so frequently happened in former times in this class of case. Local treatment was very successful. Castellani and Chambers state that these bullous eruptions are very common during the hot season in Ceylon and Southern India, and mention the occurrence of epidemic outbreaks amongst the crews of battleships stationed in the tropics.

Dr. H. G. Adamson describes a common condition of minute closely set pin-head-sized papules and papulo-vesicles extending over the neck and shoulders when there is impetigo of the head and scalp, and he has seen a generalised condition in association with extensive impetigo.

*Association with other Streptococcic Lesions.*—The related lymphatic glands may enlarge. Cases of impetigo contagiosa often shew the conditions

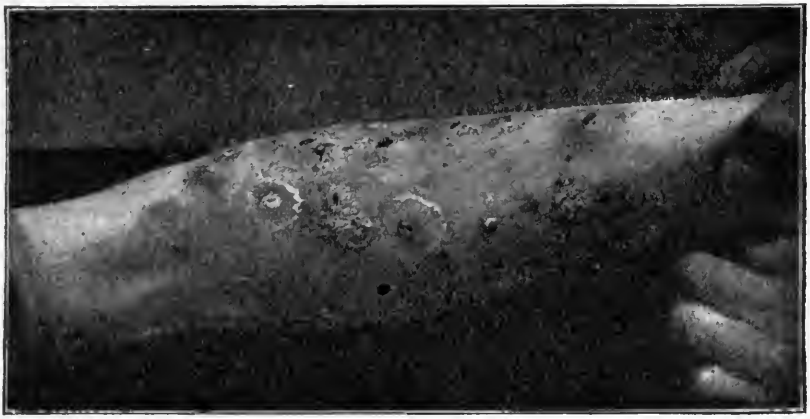

FIG. 33.—Double infection. Remains of streptococcic bullae which were perfectly formed when the case was first seen; staphylococcic folliculitis appeared later.

previously mentioned, such as diffuse raw patches behind the ears, excoriated fissures at the commissures of the lips, a form of pityriasis, ecthyma chiefly of the lower extremities, and phlyctenae or vesicles about the fingers. In rare instances the lesions may vegetate, as in other vesicular and bullous eruptions which have become puriform. The mucous surfaces near the skin are frequently invaded secondarily, but they are often the primary source of the eruption. Crocker observed a rapidly spreading erysipelas originating in impetigo contagiosa, as did Dr. Adamson. I have twice seen evidence of a toxaemia in the appearance of a scarlatiniform rash. Duvernay recorded 3 cases of impetigo contagiosa in children in whom general oedema suddenly occurred with spasmodic dyspnoea and scanty urine containing much albumin. One case died. He gives reference to 30 cases in French literature. Guiard also collected 29 cases. A secondary infection with staphylococci may set up boils and pustular folliculitis.

**Diagnosis.**—To discuss the differential diagnosis from an isolated blister to a generalised pemphigus would be interminable, but a thorough grasp of the special features of the streptococcic phlyctena, here described, and the microscope and proper culture media should obviate most difficulties. The contagious character, the tendency to the eccentric spread of the lesions, and the easy cure by local means are of further assistance. Early individual lesions may simulate chicken-pox, discoid bullae, vaccinia, and erythema iris, but the whole course, distribution, and mixture of other phases must be considered. In a few cases which conform to pemphigus in all particulars a streptococcus has been found.

**Prognosis.**—As the eruption is due to a superficial local infection of the skin by an organism of little virulence, it is benign and gives little trouble.

**Treatment.**—This is quite simple. The first essential is to open all phlyctenae, and to cleanse away all discharges and crusts as they are formed; when this has been done, the case is nearly cured. The various areas should be disinfected as far as possible; this can usually be done by boric acid lotion. Sabouraud recommends a lotion of copper sulphate 2 grams, zinc sulphate 7 grams, safran 40 centigrams, and boiled water, saturated with camphor and filtered, one litre. All that then remains to be done is to bring about healing of the excoriations by some simple remedy, such as an ointment containing 10 grains of ammoniated mercury in 1 ounce of benzoated zinc ointment. Lastly, a careful survey should be made for any inflammation of mucous membranes, such as conjunctivitis and rhinitis, and skin troubles, such as perlèche, post-auricular excoriation, and pityriasis, so that these also may be cured.

An outbreak occurred at the Beggar's Bush Barracks in Dublin in 1871, originating in children at the Curragh. Eichsted in 1885 observed it in 75 children out of 179 recently vaccinated.

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ECTHYMA (ἔκθυμα from ἐκθύειν, to break out as an eruption).—Bateman in 1817 defined and figured ecthyma vulgaris as an eruption of the large but variously sized pustules denominated and depicted by Willan as *phlyzacia*, occurring principally on some part of the extremities, and gradually enlarging with inflammation for a week or ten days, one after another, when they rupture, pour out their pus, and afterwards a thinner fluid, which concretes into brownish crusts. In about a week more the inflammation subsides, and soon after the crusts fall off. When the base was dark coloured the name *ecthyma lividum* was given, and this phase was more widespread and chronic. The important late stage of ulceration is not mentioned. Sabouraud does not confine the term ecthyma to the picture given by Bateman, but includes phlyctenular lesions on the face and neck and the hands, which do not, as a rule, ulcerate. He praises the accuracy of Rayer's observation, who described ecthyma as having a congestive stage, a phlyctenoid stage followed by a pseudo-membranous coating of the base of the cavity, and finally ulceration with prominent borders covered by a crust. It is certain that this phlyctenular stage is difficult to catch in the form recognised chiefly on the legs in England, and Brocq describes a pustule. Vidal experimentally inoculated in series from a puriform lesion, and produced pustules. I regard ecthyma as a special phase of impetigo contagiosa on the legs. Sabouraud says it is rare with impetigo of the visage, but frequent with impetigo of the body, as it is with scabies in children. It is a streptococcic impetigo with superficial and sometimes deep ulceration. The ulceration of these lesions is, as a rule, not very deep, but in certain cases with imperfect circulation of the part, or profound malnutrition of the tissues, it may be much more marked. The lesions of ecthyma are generally not very numerous, and are usually isolated. They must not be confounded with suppurating and ulcerating syphilitic and tuberculous nodules.

**Bacteriology.**—Bezançon and Thibierge announced the streptococcic origin of ecthyma occurring on the body in 5 or 6 cases in 1897, and Balzer and Griffon examined 14 cases, and without exception found streptococci. The inoculation of rabbits gave rise to abscesses, erysipelas,

and fatal septicaemia. Sabouraud says that in the ulcerative condition the search for this microbe is often not successful, but is best carried out by scraping the border with a curette after painting with cocaine. The streptococcus can, however, be cultivated by causing congestion of the part by the patient standing for a quarter of an hour and then the serum

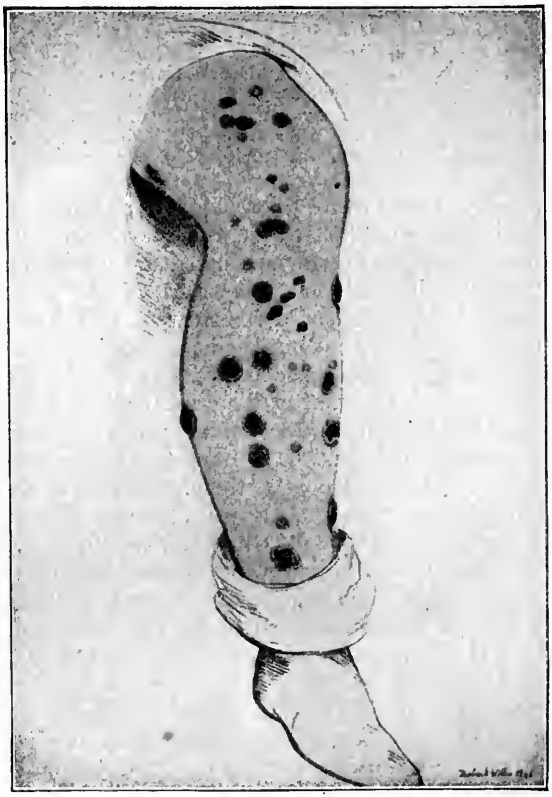

Fig. 34.—Ecthyma. (Copied from R. Willis's Atlas.)

is collected. Gilchrist obtained pure cultures of *Streptococcus pyogenes* from beneath the crusts in two typical cases.

**Morbid Anatomy.**—The ulcerated lesion shews superficial necrosis and intense congestion of the dermis with dilated vessels and a surrounding sheath of cells and oedema.

**Treatment** consists in clearing away the crusts, cleansing the ulcerated surface, and applying a dilute ammoniated mercury ointment. Where the ulceration is obstinate the pasta amyli et iodi will be found useful. Sabouraud mentions washing with a feeble antiseptic solution, then for twenty-four hours filling the wound with subcarbonate of iron.

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**Ecthyma Terebrans and Dermatitis Gangrenosa Infantum.**—This is not the place to discuss the cases recorded under these names. Some of them may be of streptococcic origin, but they form a group of varied etiology in which marked necrotic processes supervene on the lesions of chicken-pox, vaccinia, and many vesico-pustular lesions. It is difficult to determine the exact nature of the disease, which was formerly endemic in many parts of Ireland and at times epidemic, and caused a high mortality. Sir D. Corrigan describes it, and quotes others, especially Whitley Stokes's paper in 1807. He called it *Pemphigus gangrenosus*, and says it was not rupia escharotica on the ground that it was not a pustular eruption. The country people knew it as "white blisters," "burnt holes," and "eating hives." It attacked children from three months up to four or five years old. The eruption was vesicular at first, and might be mistaken for chicken-pox. The vesicles enlarged for some days; burst and discharged a thin fluid, usually limpid at first but sometimes whitish or yellowish. Confluence might occur. This was followed by ulceration with undermined edges, which enlarged rapidly with remarkable fetor. The child often died by the tenth or twelfth day. Fever rarely ushered in the evolution. M'Adam is quoted as observing that fluid from the blisters caused "erosions" where it dropped (*vide* also pp. 66-69).

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Chronic Epidermiditis with Streptococci. — Sabouraud has described a diffuse chronic strepto-epidermiditis with special bacteriology, morbid anatomy, and symptoms. He has published a picture in *La Pratique dermatologique*, and the following account is taken from his description.

**Bacteriology.**—Streptococci can easily be found in all stages by a proper method.

The **morbid anatomy** of the phase of partial lichenisation shews all the elementary characters of the first stage of a streptococcic phlyctena. The stage of constituted lichenisation is displayed under the successive corneous layers of exfoliation, which have preserved their nuclei (parakeratosis), and in isolated points rudiments of the prevesicular spongiosis. The epidermis

is thickened and the interpapillary processes much elongated with proliferation of the Malpighian layer (acanthosis). The dermis is thickened, congested, and studded with embryonic cells. The appearance differs from that of chronic eczema secondarily infected with streptococci. The process of congestion, phlyctenisation, erosion, and papulation is seen also in Jacquet's dermatitis of infants, and in the vacciniform dermatitis.

**Symptoms.**—It commences by an acute stage, continues subacutely, and terminates in a chronic condition. It arises usually after a local trauma, as in the various forms of occupation dermatitis, and, like these, generally on the upper extremities. The first symptoms are local heat, smarting, and itching with a violaceous skin a little swollen, but without glandular enlargement. Next morning there are large irregular placards of redness, as big as the palm of the hand or larger, badly limited, irregular, covered with a multitude of oval erosions, exuding drops of serum. These erosions are mixed with papules giving a very special picture. The erosions are probably preceded by vesication, but Sabouraud has not seen them. For some hours the hand or wrist is covered with the eruption, which may extend up the arms. New patches form, preferentially on the flexures of the wrists, elbows, and where fine skin exists, as on the inner aspects of the thigh and leg. This eruption may become more or less generalised in a few days, but the patches are always spaced in all stages. On the second day fine orificial follicular pustulation may be observed, and signs of scratching, producing a polymorphic picture comparable to that of chronic eczema. Then follows a stage of impetiginisation preliminary to the lichenisation of French writers. A patch dries up in some days and yellow-grey papyraceous crusts form, thus emphasising the spotted aspect. As lichenisation becomes established, the place of the spots on the patches is taken by humid papules and some attempt at crusting. In the early part of this third stage mixed phases may be seen. Eventually the lichenisation is established; exudation and crusting gradually cease; the patches get dry, thickened, quadrillated, movable on the underlying structures, with flat dry papules, very slightly scaly, and of a lilac-rose colour. The patches may get somewhat paler, but exacerbations may occur.

The **diagnosis** must be made from chronic eczema and eczematised prurigo.

Streptococcic Phlyctenular Eruption of the New-born or so-called Pemphigus Neonatorum.—**Etiology.**—In rare instances the child may be born with the eruption, and in these cases the mother is probably infected, for years ago this eruption was frequent like the various forms of puerperal infection and sclerema. It commonly starts from the third to the sixth day after birth, but it may not appear till the fourteenth day, and sporadic cases of a similar type may occasionally occur in older children. It may start in almost any situation, but it seems to be most frequent on the neck, then on the chin or cheek, the eyelids, arm, or back.

The eruption occurs sporadically, or in epidemics, which were common in lying-in institutions, or in the practice of a particular midwife. The skin must be infected from the mother, or by the hands or articles used by attendants.

**Bacteriology.**—Examination of the contents of the phlyctenae has frequently disclosed the presence of micro-organisms, and especially in older days staphylococci and diplococci. From the bullae in a case of pemphigus neonatorum under Winfield's care Blatters isolated a chromogenetic organism resembling *Bacillus pyocyaneus*, and a diplococcus growing in bouillon but not on agar. Winfield found the *Bacillus pyocyaneus* and a diplococcus. The clinical evidence is strongly in favour of a streptococcic infection, and no doubt with modern methods of culture this infection will be placed on sure grounds; this organism has been isolated by several observers, including Dr. Arthur Whitfield.

**Morbid Anatomy.**—The phlyctena is formed by a cleavage due to serous exudation between the cuticle and the rete, as in impetigo contagiosa. In a section of the undermined border Dr. Whitfield found enormous dilatation of the blood-vessels but no cellular infiltration, deep epithelial oedema and masses of cocci in the rete but no chains. Dr. Maguire described thrombosed vessels of the skin and some round-celled infiltration with scattered micro-organisms along the whole length of the free edge of the Malpighian layer. In the sites of the old bullae there may be evidence of considerable necrosis and degeneration of tissue.

**Symptoms.**—This eruption, which occurs sporadically and epidemically, is an external infection of the skin, and, until systemic infection occurs, generally without constitutional symptoms, and, except for the presence of phlyctenae in both, has no relation to true pemphigus. It is inoculable on mothers and others in attendance, and auto-inoculable on the patient, and is probably only a phase of streptococcic impetigo contagiosa, with some modifications due to the condition of the skin of newborn children. When inoculated on the mother or others in attendance it generally assumes the ordinary impetigo contagiosa type. Willan mentioned it, Brocq says that Rigby was the first to describe an outbreak in a lying-in hospital, and Almquist infected .himself. Scharlal also successfully inoculated himself, and Dr. Maguire, in an account of an epidemic at Richmond, described the lesions as commencing by small circular pale-pink macules about the size of a flea-bite. The whole surface, except a narrow peripheral border, becomes wrinkled as the result of separation of the cuticular layer by a serous exudation, which accumulates until a phlyctena, half to one inch in diameter, forms. The phlyctena is soon ruptured, and serum oozes from a red, moist, smooth, glistening area. Meanwhile from the eccentrically spreading periphery the cuticle is easily pressed away, shewing that a cleavage is also going on there. This characteristic undermining of the cuticle progresses, and the denuded area left behind is correspondingly increased. These lesions may coalesce and form tracts which are sometimes figured. In cases which are less intense and get well, this eccentric spreading is limited, and a yellowish

incrustation may cover the patch, and in six or eight weeks only a reddish coloration is left, but no scarring. In more intense and often fatal cases the eccentric spread continues unchecked, so that relatively enormous areas are involved, which remain moist. Besides the changes described, vesicles, arising apparently *ab initio* with scanty contents, may be seen. New phlyctenae arise by local contagion, as evidenced by the sites involved, namely, where two portions of skin are in apposition, as in the neck, axillae, groins, genitals, nates, inner aspect of the thighs, and the flexures of the elbow and knee. The face, back, shoulders, and scalp are comparatively rarely involved, and Dr. Maguire says that the extensor aspects of the forearms and legs, palms and soles, never suffer. Occasionally there are additional features, such as some haemorrhage into a bulla, or the onset of ulceration and a necrotic process described as gangrene. The eruption may commence in almost any situation, but frequently begins on the chin and neck. Ruggles records the onset on the fingers in all the cases but one in an outbreak. The number of lesions present is very variable, isolated or scanty or numerous. Their shape may be determined by folds of skin, or they may spread in one direction only. Subjective phenomena, other than the pain of excoriated areas, are little marked. The mucous membranes adjacent to the skin may be invaded. Thus conjunctivitis and catarrhal ophthalmia are mentioned, also stomatitis, excoriated and swollen tonsils, and intense hyperaemia of the mouth. Dr. Maguire mentions that a yellowish fluid can be expressed from the mouth and nostrils after death, and has observed this during life. Mild cases which recover are practically free from all symptoms except the eruption. In the extensive and more intense examples, which tend to be fatal, there are symptoms pointing definitely to a secondary systemic infection. The eruption spreads over the abdomen to the umbilicus, which in these infants is not yet healed. The umbilicus becomes inflamed and the abdomen distended. The infant then is disinclined to feed, and vomits after and later without food. The lungs become congested with serous exudation, dyspnoea and cyanosis follow, and death terminates the scene. There is nothing characteristic about any fever that may be present, and the temperature is often subnormal. Some infants succumb in a few days, when the skin is extensively involved apart from systemic infection, apparently as in burns. Staphylococcic infections, such as boils and abscesses, may occur as complications. As in true pemphigus, this eruption may obviously take on various phases, which have been described as acute pemphigus, pemphigus foliaceus, and dermatitis exfoliativa neonatorum. Ulceration and necrosis sometimes occur in the patches, and the condition has then been spoken of as pemphigus gangrenosus or rupia escharotica. Fuller, for instance, describes an acute pemphigus, *i.e.* a sudden febrile generalised eruption of great bullae, and some days later an infant in an adjoining bed got typical impetigo contagiosa.

**Prognosis.**—The gravity of the affection seems to vary greatly in different outbreaks. Thus, Homolle in 1874 recorded that only one

case died out of about 79 affected, but in the St. Louis Hospital epidemic in 1877 about half the cases died. Another observer mentions that all of 15 cases were fatal. In certain cases a fatal ending comes in a few days.

**Diagnosis** is only difficult in isolated cases to the inexperienced, and in early stages the observer must remember the existence of such eruptions as the bullous syphilide of the hands and feet, epidermolysis, the rare bullous erythemas, and pemphigus. The apparently local character of malady at first, the ease which a cure is effected at the outset, the epidemic character, inoculability, and auto-inoculability will distinguish it.

The **treatment** is the same in principle as that of impetigo contagiosa. All traces of the discharges and microbes on the surface must be systematically cleansed away, and then the skin powdered with boric acid, or dressed with zinc cream or dilute ammoniated mercury ointment. Short baths with a disinfectant such as potassium permanganate are useful. The infant must be kept warm.

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Dermatitis Exfoliativa Infantum.—Under this title Ritter von Rittershain of Prague, in 1878, described an eruption, which he thought non-contagious and pyaemic, appearing from the second to the fifth week of life without early constitutional symptoms. In his 297 cases observed from 1868 to 1878 no less than 48·82 per cent were fatal. It was characterised by initial dryness and slight desquamation and redness of the lower part of the face with subsequent moisture, fissures at the angles of the mouth, hyperaemia of the buccal cavity, and with erosions covered with a grey coating. The redness then extends in patches over the body, and the epidermis is lifted up by a slight collection of fluid exudation. By the removal of the epidermis the dark-red cutis is exposed and appears like the effect of an extensive burn. Crusts may form. The hands and feet are particularly attacked. Ritter also described as a variety an initial stage of miliary vesicles chiefly forming on the forehead and neighbouring scalp—a pemphigoid and eczematoid eruption. Furuncles, abscesses, phlegmonous infiltration, and gangrene may appear as complications. Out of 274 cases 50 per cent died from complications such as intercurrent pneumonia and colliquative diarrhoea. The name, and the prominence given to the dry scaly phase, led to much doubt as to the nature of the eruption. In Dr. Skinner's case, entitled

"dermatitis exfoliativa neonatorum," there was intense vascularity of the hypoderm and upper part of the dermis, with some thrombosis, but singularly little cellular infiltration. The rete was thinned, and where this was most marked the cells were degenerated. There was a prodigious collection of streptococci on the surface. Writers often refer to the raising of the epidermis by serum as exfoliation. In the cases described by Hediger the vesico-bullous eruption was less marked than the generalised erythema and exfoliation, but a case of typical pemphigus neonatorum occurred in the practice of the same midwife. According to Dr. Ballantyne, it may be stated to be a general and excessive desquamation of the cuticle occurring in the neonatal state; it is, in fact, a keratolysis of the

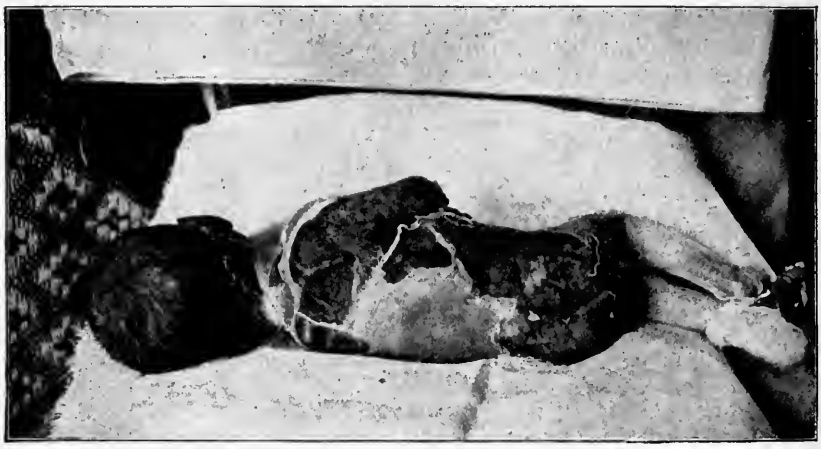

FIG. 35.—Dermatitis exfoliativa Infantum (Skinner).

new-born (keratolysis neonatorum). At the present time this eruption is generally regarded as really a phase of the so-called pemphigus neonatorum, in which many cases are markedly exfoliative; according to Winternitz, Luithlen, and Bender, however, there is more increase in the prickle layer histologically than in pemphigus neonatorum, but this was not confirmed by Hedinger.

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SIMPLE INFANTILE DERMATITIS. — Under this term Jacquet has described a multiform dermatitis in infants, tending to evolve in succes-

sive crops, and important as it may be confounded with syphilides. It is generally localised about the napkin region, but in rare instances it may extend over the body, and even to the face and down the legs. The eruption goes through stages, and when a case comes under observation there may be the lesions of one stage or a mixture of several. The first stage consists in a simple congestive dermatitis, often fugacious and simply peri-anal, or over the napkin region or more widely spread. These congestive macules become scaly and may shew callosities. Next, these macules pass into vesicles, or vesicles form from the onset and appear specially in certain positions, such as the convex regions of the napkin area, where they may be grouped in variable number, and they may be detected at the periphery of infected regions. These lesions vary in size from a pin's head to a lentil, and are round or become polycyclical by union. It is unusual not to see them on the border of diffuse erythemato-squamous areas shewing as greyish insignificant vesicles, which break and leave erosions, especially where the skin is in contact with other parts in a further stage. These erosions thicken up and form brown-red or violaceous, flattened, rather discoid papules from a pin's head to a lentil in size (post-erosive syphiloid), which was thought to be a syphilitic eruption by Parrot. There may be four or five only or many of these erosions, and some may have a puckered border. Some of these erosions may undergo slight ulceration as the result of uncleanliness, and there is often a little inter-triginous congestion in the folds of the skin. The lymphatic glands do not enlarge.

**Etiology.**—Various causes have been assigned, such as faecal contamination and athrepsia. Brocq considers that it is streptococcic, and the phases of evolution seem certainly to have an affinity with those of vacciniform dermatitis of infants and Sabouraud's post-impetiginous and post-ecthymatous lichenisation.

**Histology.**—The vesicle is said to be caused by oedema of the epidermic cells, which then burst and disintegrate so that a cavity forms between the stratum corneum and the rete. The dermis is congested, especially in the venous plexus. The papules are due to cell infiltration round the vesicles in the papillary layer and sometimes deeper.

**Diagnosis.**—Those who have not given attention to the eruptions of infancy may have some difficulty. The important point is not to diagnose it as syphilis, though it may occur in a syphilised infant.

**Treatment** consists in strict cleanliness and powdering the parts with some antiseptic powder, such as boric acid.

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VACCINIFORM DERMATITIS OF INFANTS.—This rather uncommon eruption is peculiar to infants, and was observed about the same time in 1889 by E. Besnier (*Syphiloïde vacciniforme infantile* and *érythème vacciniforme syphiloïde*), by A. Fournier (*Herpès vacciniforme*, *Ecthyma chancriforme infantile*), and by Hallopeau (*Ecthyma vacciniforme syphiloïde*). These names, none of which are quite satisfactory as applying to all the phases seen, point to the simulation of vaccine lesions and of syphilides, and the latter is further suggested by the site of predilection which is on the upper parts of the thighs, the genitals, and peri-anal regions in infants. The eruptive elements may present many different aspects, making a multiform picture, or one phase may predominate.

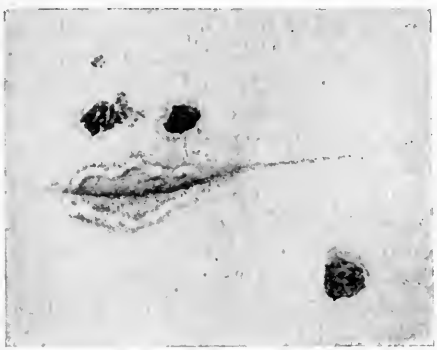

FIG. 36.—Vacciniform dermatitis. Photograph of water-colour drawing shews the small erythematous papules, the excoriations with raised rims, and the fissuring of the folds. The dark tints in the reproduction are red in the original.

The lesions commence by an erythematous macule, which may be covered with a mixture of serous exudation and cuticle to form a cream-coloured diphtheroid coating. Sometimes vesicles or small bullae may form and get umbilicated, and when the contents become puriform vaccine lesions are closely simulated. Often the macules become papules and, when not coated with a diphtheroid covering, they may closely correspond in appearance with syphilitic papules. Again such papules may extend peripherally leaving a dull-red centre, whilst the border may form a raised rim covered with a creamy deposit. I have seen one the size of a florin. These elements may be isolated, grouped, or confluent, and in the latter case with an eccentric spread, raw areas are produced bordered with a raised polycyclical rim. Some alteration may occur. I have observed an outlying erysipelatoid flush. In addition to the sites of predilection mentioned, Hallopeau observed lesions in the popliteal space and on the adjacent part of the leg. I have seen various lesions of streptococcic infection on other parts of the skin, including small vesicles on the hands and feet. The lesions appear to be auto-inoculated, especially where there are folds in the skin and adjacent surfaces touch.

Without some experience of this eruption, the *diagnosis* may be very difficult, and vaccine inoculations and inherited syphilis may be strongly

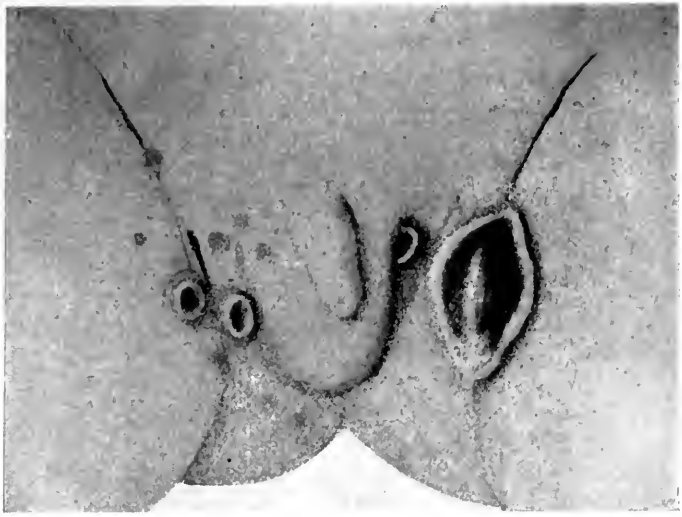

FIG. 37.—Vacciniform dermatitis. Photograph of a water-colour drawing. The lesions are superficial congested macules with a slight diphtheroid coating.

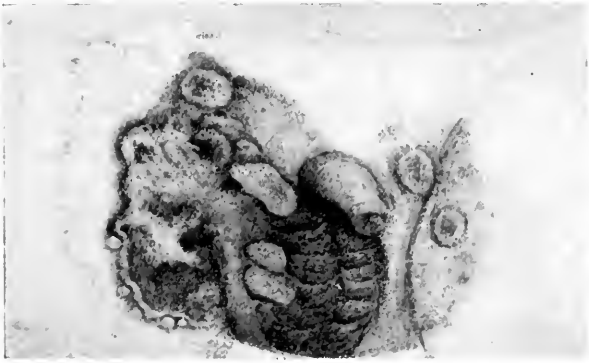

FIG. 38.—Vacciniform dermatitis. Photograph of water-colour drawing shews a multiform picture, the vacciniform lesions, diphtheroid papules, the excoriated area bordered on the right thigh by a raised rim and beyond that by small translucent vesicles, and farther out still by a margin of erythema.

suggested, but the whole picture is very characteristic to the practised eye.

**Etiology.** — Clinically there is much evidence in favour of the view that it is a streptococcic infection, and the streptococcus has been cultivated from various lesions in 4 of my cases. Mantegazza isolated

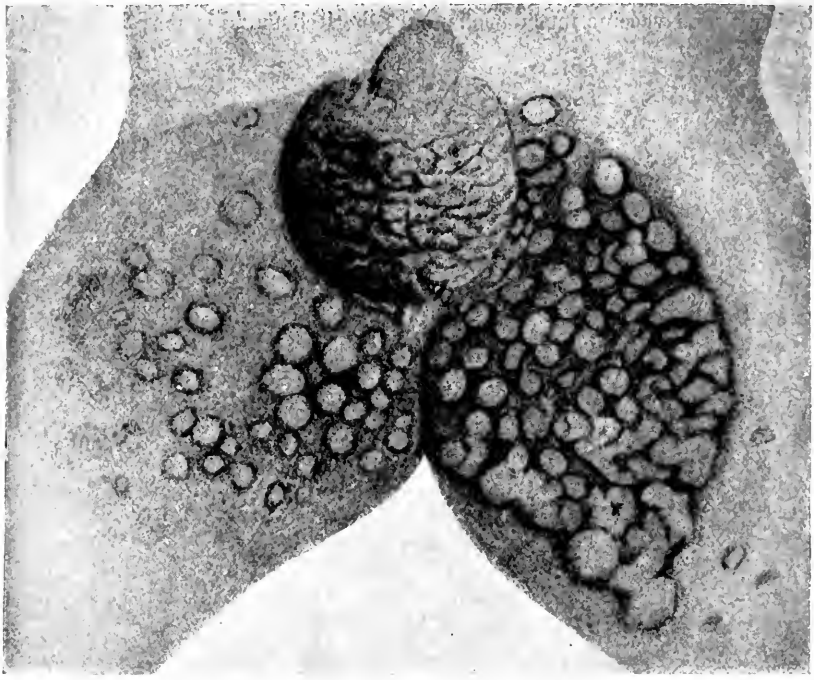

FIG. 39.—From the same case. Excoriated peri-anal region bordered by an opaline rim with outlying small ecthyma lesions.

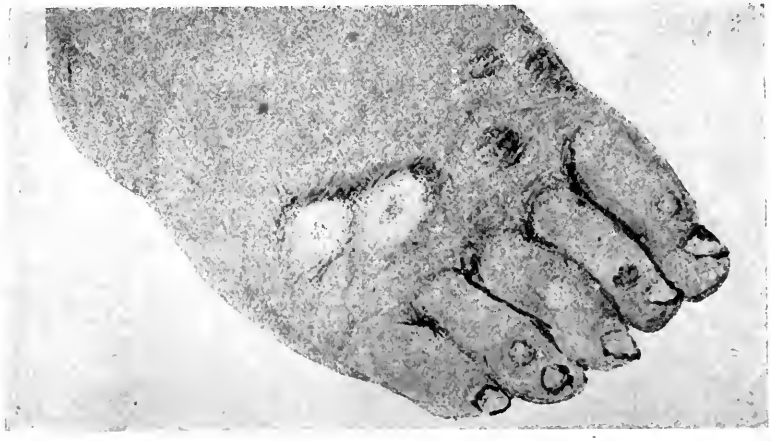

FIG. 40.—Vacciniform lesions or lesions like herpes iris on the dorsum of the foot with vesicles on the toes.

the colon bacillus, but as the child had diarrhoea this was probably due to contamination.

The **treatment** is very satisfactory, and should consist in persistent cleansing of the lesions and disinfection and subsequent occlusive applications.

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IMPETIGO PITYRODES (Sabouraud).—SYN.: *Furfuraceous Impetigo.*—Furfurations of the visage have been recognised, according to Sabouraud, since the eighteenth century. It is the *Herpes furfurans* of Roussel, Alibert, Duchêne-Duparc, and Baumès; the *Dartre volante* of Alibert; the *Pityriasis du visage* of recent authors. Sabouraud in 1904 distinguished a streptococcic pityriasis of children from ordinary pityriasis associated with a similar condition on the scalp. It is a contagious eruption in schools, and epidemics reach their acme and then die down leaving sporadic cases. Medical men who examine many children see it constantly (*vide* Fig. 1, Pl. II.). Unna calls it dry eczema, and attributes it to cocci of secondary infection. Sabouraud says the mucous membranes of the child are very often the seat of chronic streptococcic infections. Savill described in 1894 and 1895 an epidemic in a large London school, in which 44·1 per cent were affected, and many of the children had pediculi of the scalp, and some impetigo contagiosa. The eruption of congestive macules with branny desquamation was almost entirely confined to the face, especially around the mouth, but a few children had it on other parts of the body, some on the legs, and some on the arms.

In the epidemic described by Dr. Abraham the treatment was successful by the local application of a little mercurial or tar ointment. Sabouraud recommends an ointment of tannin with ether ℥xx., calomel gr. xv., paraffini mollis ʒj.; and to prevent infection he suggests washing the face with a one tablespoonful of the following in the washing water, zinci sulphatis ʒijss., cupri sulphatis gr. xl., aq. camph. ad ʒx.

RECURRENT ERYSIPELATOID ATTACKS ON THE FACE.—A recurrent and, later a persistent, oedematous swelling without pitting, characterised as "solid oedema" by Sir Jonathan Hutchinson; involving the whole or limited portions of the face, such as the eyelids or one of the lips, has long been known and described under such names as *recurrent erysipelas* (J. Hutchinson, 1883), *erysipelas perstans faciei* (Kaposi), *erythema perstans faciei* (Kreibich), *lymphangitis faciei* (S. Mackenzie), *persistent*

*lymphatic oedema.* It is characterised by recurring attacks at short, long, or irregular intervals, in which the skin swells sometimes with reddening and signs of inflammation, but often not. The part attacked becomes oedematous in such a way that pitting on pressure is absent. In many cases there is no febrile or other constitutional disturbance; only some local discomfort. Some authors describe chills and shivering, or prostration and some fever. Sir Jonathan Hutchinson said that the first attack is the most severe, and later recurrences milder. At first the swelling gradually disappears in a few days in the same way as angioneurotic oedema does, but after repeated attacks, and they are sometimes very frequent, the affected part becomes the seat of a permanent solid

FIG. 41.—Persistent solid oedema of the face. (J. Anderson Smith.)

oedema, and a young woman's features may become so distorted that she looks much older than her age.

The **etiology** has not been settled, but the general impression is that the condition is due to streptococcic infection and that it resembles the recurrent attacks seen in other parts, as the legs, where it induces a form of elephantiasis. In many cases the nose has been found to be the site of dermatitis, and a minute search should always be made in the nose, eyes, mouth, and gums for any possible site of origin. Sometimes no clue can be obtained. Exposure to cold is said to favour attacks.

**Diagnosis.**—Local swellings of the lips, eyelids, and other parts may simulate angioneurotic oedema, and when the whole face is involved a first glance might suggest myxoedema, leprosy, dropsy, or lymphodermia perniciosa.

**Treatment.**—The effect of local methods is often very unsatisfactory. In some cases good results have followed streptococcic vaccination; exposure to cold must be avoided.

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T. C. F.

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## DERMATOSES OF STAPHYLOCOCCIC ORIGIN

By T. Colcott Fox, M.B., F.R.C.P.

Introduction.—Staphylococci are frequent denizens of the skin and the mouths of the follicles, and may remain without pathogenetic action unless special conditions of the soil arise from causes, internal or external, which favour pathogenetic qualities and virulence. On the other hand, active microbes may be introduced on the scene from other sources. The staphylococci are of wide importance as agents of initial or secondary suppurative inflammations and systemic infections. Sabouraud insists on the purity of their own formations whether superficial or deep; and though they may infect secondarily multitudes of open cutaneous lesions, when associated with other organisms the staphylococci are secondary. Their differentiation and classification are not definitely settled, but the subject is of special interest because some authors, such as Unna, believe that different species can cause special lesions. We shall therefore briefly refer to recent work of British investigators. Drs. Andrewes and M. H. Gordon stated in 1907 that the Gram-positive or true staphylococci are characterised by their morphological grouping in clusters, by their uniform size, and the readiness with which they can be grown on ordinary culture media. They do not shew any disposition to an intracellular habitat, though they are often enclosed in cells as a result of phagocytosis. "By far the commonest and most important of the pathogenetic staphylococci is the organism known as *Staphylococcus pyogenes*, responsible for a large proportion of the acute localised suppurative processes seen in man, and more rarely of generalised septicaemic and pyaemic processes. The typical form of this organism develops an orange pigment, and is known as *Staphylococcus pyogenes aureus*; but we have brought forward reasons for the belief that the lemon-tinted and white forms of this coccus are specifically identical with it, *i.e.* that there are no grounds for supposing *Staphylococcus pyogenes citreus* and *albus* to be other than varieties of the commoner form, due to partial or complete suppression of its chromogenetic properties. We regard the common saprophytic coccus of the skin, *Staphylococcus epidermidis albus*, as a species perfectly distinct from the foregoing, and

readily distinguishable by its biological characters. Though of feeble pathogenetic powers, we consider this species capable of playing some part in disease-processes." This organism occurs on the epidermis of the hand, cheek, scalp, and forearms with such frequency that it may be considered characteristic thereof in the same way as *B. coli* is of the large intestine and *Streptococcus brevis* of the mouth. It is important to note Dr. Dudgeon's conclusion that an infection due to one staphylococcus may not respond to a vaccin made from another strain, even when isolated from a similar source, whereas it may react to the patient's own organism.

The researches of Ogston, Passet, Rosenbach, and others demonstrated the relation of pyogenetic organisms and suppuration, and it is said that all the purulent skin eruptions are due to local inoculation of pyogenetic microbes, primarily or secondarily. Some classical researches should be mentioned. In 1880 Pasteur isolated a staphylococcus from a boil, and then in osteomyelitis. In 1885 Garré, investigating the microbes found in acute abscesses, rubbed his arm with a pure culture of a third generation of staphylococci, and provoked an eruption of numerous small pin-head pustules with a red areola seated about the pilo-sebaceous orifices; these gradually increased to the size of lentils, and finally led by confluence to the formation of an enormous carbuncle surrounded by furuncles. He also set up a phlegmon by deep inoculation, and brought about a sub-epidermic suppuration—the early stage of a whitlow—around the nail. In 1887 Bockhart examined the pus of pustules in thirty-two cases of impetigo, and always found *Staphylococcus aureus* and *albus*, in pure or mixed culture, in the fluid or cells, isolated as diplococci or grouped. He found that the clear vesicles of impetigo contagiosa were free from these organisms. He inoculated himself with a sixth and again with a tenth generation of *Staphylococcus aureus* and *albus*, and provoked pustules, some seated about the hairs, some about the sweat follicles, and some not so and rather larger, and from these pustules the cocci were found again. Two furuncles also formed. There was not any special tendency to eccentric spread as in impetigo contagiosa, and he concluded that a certain type of impetigo and sycosis and boils were due to staphylococcic infection, and that these organisms living as saprophytes on the skin can engender these eruptions when they penetrate the epithelial tissues, either by the follicles or by abrasions. Zackermann also in 1887 inoculated himself on four occasions by rubbing into his skin, scratched by his fingers, pure cultures of *Staphylococcus pyogenes aureus*, and set up pustules containing similar organisms. Bousquet again, in 1889, inoculated his arm with a pure culture of *Staphylococcus pyogenes albus*, and produced pin-head pustules, which were in turn found inoculable and contained the *Staphylococcus albus*. At this date the facility with which staphylococci invade secondarily various primary lesions due to other causes was fully recognised.

**Varieties of Staphylococcic Cutaneous Eruptions.**—These are of two orders, the one produced by external infection, the other occurring in systemic infections, and they may be primary or secondary.

A. *Primary infections of external origin* may set up various phases of purulent peri-folliculitis according to the depth to which the hair follicle extends, the extension of the infection in the follicle, and the virulence of the cocci. Thus, the characteristic pustular inflammation may be localised around the mouth of the follicle. A special phase occurs on the scalp of children, where minute pustules are obscured by their rapid drying up into scale-like crusts (pityroid form). By deeper infection, especially in regions with deeply-inserted strong hairs, as in the beard, larger peri-follicular pustular inflammations are produced; for example, the so-called staphylococcic sycosis. Such pustules, sometimes called acneiform, may evolve on the nape of the neck and adjoining scalp, and by confluence and secondary changes form extended plaques of multiform aspect, described under such names as acne cheloid and dermatitis papillaris capillitii. A deep peri-follicular infection is the cause of the furunculus or furuncle or boil, in which there is the additional formation of a mass of dead tissue (the core or bourbillon of the French), yet the characteristic suppuration may be more or less present. Then comes the carbunculus or carbuncle, in which the lesion consists of a conglomeration of boils with corresponding dead tissue, and sometimes more or less surrounding and spreading suppuration. Abscesses in the dermis, hypoderm, and subcutaneous tissues, generally circumscribed, are another form of lesion, and may occur with various grades of pustular folliculitis. They are sometimes seen in remarkable numbers in the skin of young children. Lastly, when the folds of the nails are involved, an inflammation pustular *ab initio* may form, superficial or deeper, and then sometimes spreading into the tendon sheaths. A chronic onychia, whitlow, panaris, or felon may also occur.

*Secondary Infections of External Origin.*—These form a vast category in which pre-existing and independent skin eruptions become secondarily infected with staphylococci, such as eczema, acne, scabies, and syphilis; indeed the majority of eruptions may be so contaminated. We often see also, as in scabies, these secondarily infected eruptions giving rise to pure staphylococcic lesions intermixed.

B. *Staphylococcic lesions* may also occur in the skin as a symptom of haemic infection, as well as other forms of eruption, such as purpura.

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PUSTULAR PERI-FOLLICULITIS.—The staphylococcic eruptions included under this heading are common, but present certain variations in their aspect according to the depth to which the skin is affected and the size of the pustules. These lesions were comprised in the old impetigo, and the more superficial, seated about the mouths of the pilo-sebaceous follicle, are often called *impetigo of Bockhart*, who helped so much to differentiate this staphylococcic form from the streptococcic impetigo of Tilbury Fox. This common inflammatory pustular eruption is characterised by an early stage of slight red congestion, generally and characteristically seated about the mouth of a follicle, and is rapidly succeeded by a yellowish miniature abscess (a pustule *ab initio*) situated in the epidermis, usually around the mouth of a pilo-sebaceous follicle, and centred by a hair, making a hemispherical projection, the centre of which may be slightly tucked in. The pustule is comparatively free from fragility, and therefore often dries up entire into a tiny lesion forming a scale-like crust, or into a larger one with a thicker crust. It disappears, and the more superficial ones do not leave any scars. In number they may be scanty and widely separated, or numerous and crowded and even confluent. They may occur in any part of the body. The eruption may relapse, and be chronic with the successive formation of lesions. The superficial pustules may vary in size up to that of a lentil; but a deeper infection may complicate the picture by the formation of boils and abscesses.

Sabouraud mentions the following different phases:—(1) An acute, primary, discrete, disseminated, orificial, pustular peri-folliculitis, occurring rapidly on the borders or on a large part of the scalp of infants, with enlarged lymphatic glands which may first attract attention. This eruption may heal up in a few days, or relapse. (2) Redness of the scalp, with pain, itching, and enlarged glands, followed in some hours by a miliary pustular peri-folliculitis, often coherent, and drying up into lenticular crusts and pityriasis-like exfoliation. (3) Miliary relapsing peri-follicular pustules on the extremities, often seen in workmen. (4) A disseminated form, relatively discrete, which may implicate the whole surface. It is persistent, and apt to occur in persons out of health in various ways.

**Etiology.**—The causes are numerous and depend on the regions attacked. The primary lesions may apparently arise spontaneously, or are frequently preceded by various forms of trauma which render the skin favourable to the growth and pathogenetic action of the cocci. Thus the action of tar and its products may set up a pustular folliculitis of all grades, and such an eruption may be accompanied by other forms of

artificial dermatitis. Thapsia and croton oil and a host of other irritants bring about a similar result, and stimulating lotions often act in this manner. These conditions are commonly diagnosed as pustular eczema, and a vesicular dermatitis thus occasioned may become secondarily pustular. Epilation, practised in France in favus and ringworm, was often followed by pustules, and a similar occurrence may follow the application of *x*-rays to the scalp. Secondary staphylococcic infections may occur in many inflammatory eruptions, such as eczema, intertrigo, streptococcic phlyctenae, the bullae of pemphigus, scabies, and eruptions excited by lice on the scalp and body. In certain cases the state of the health and consequent malnutrition of the tissues appear to play a disposing part, for instance in gastro-intestinal disorders, albuminuria, and glycosuria.

**Pathology.**—In the miliary form there is a miniature abscess seated around the summit of the follicle in the epidermis, superficially or deeply. The roof or cupola is formed of an epidermic layer of varying thickness, containing in the summit of the abscess mulberry groups of cocci and some isolated cocci. It is filled with migrated cells mixed with detached epidermic cells. The roof may be a sequestrum riddled with leucocytes. The epidermic floor may be ulcerated and a dermic sequestrum formed. The cocci enter the corneous layer, and multiply laterally round the mouth of the follicle. Innumerable migratory cells rush to the side and cause swelling and dissociation of the epidermic cells with the formation of an abscess cavity in which the migrating cells are killed with liberation of their nuclei. The pus frequently contains dead and broken-up epithelial cells. The follicles are isolated. Staphylococci are present in a pure culture throughout in the summit of the abscess, and are generally found also in the mouth of the follicle. The peripilar localisation is not absolutely constant. The cultivated organism can be inoculated and recovered from the lesions produced. In cultures the *Staphylococcus albus* is often found with the *Staphylococcus aureus*. Sabouraud used an agar-urine or neutral agar-peptone for culture. An acid agar and glycerin affect the colour of the organisms. For immediate demonstration he places the pus on a glass slide, and fixes it by passing the slide two or three times over a flame. The organism can then be conveniently stained by a drop of methylene blue. The preparation is then washed in water, dried, and examined with a homogeneous immersion-lens. The agglomerated cocci are seen between innumerable migratory cells, or the specimen may be stained by Gram's method and counter-stained with Orth's carmine or eosin.

The **diagnosis** will be generally easy in the light of the foregoing description. It is hardly necessary to say it cannot be confounded with the numerous non-pustular follicular miliary lesions, such as pityriasis rubra pilaris and keratosis pilaris. When the staphylococci secondarily infect existing lesions, the distinction is not always so easy.

The **treatment** of the superficial pustular peri-folliculitis is satisfactory. It is only necessary to cleanse the diseased areas thoroughly by disinfectants, and then to apply a simple ointment. In the scalp I

have had good results from the application of weak tincture of iodine. It is said that staphylococci are particularly resistant to perchloride of mercury. Sabouraud extols the use of sulphur. As the follicle gets more deeply infected, the cure becomes more difficult, as it is impossible to reach all the organisms, and in obstinate cases vaccine treatment may be necessary.

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SYCOSIS.—At the present time this term is used to denote a chronic suppurative staphylococcic peri-folliculitis of regions, especially the face, provided with strong and deeply-implanted hairs, so that the process tends to be deeper and more intractable than in the miliary pustules.

**Etiology.**—The cause is a local staphylococcic infection, but as the onset may be insidious, it is often impossible to trace the source. Barbers are frequently incriminated. Rhinitis is usually the source from which the upper lips become infected. Sometimes an infected eczema may start it. Various constitutional disturbances may possibly favour the local conditions necessary for its occurrence.

**Morbid Anatomy.**—The condition is a suppurative inflammatory peri-folliculitis, but there may be deep indolent nodules forming a cold abscess, and more acute painful abscesses. Further, the diffuse infiltration and sclerosis, and cicatrisation of chronic cases present additional features.

The **symptoms** vary with the intensity and chronicity of the infection. The patient usually presents himself with inflammatory papulo-pustules or pustules centred by a hair, disseminated over the region of the beard or whiskers or upper lip. The eruption may begin at any part, or in several places, and as the elements multiply, slowly or rapidly, the affected areas become larger, and there is a tendency for the whole whisker and beard region to become covered. The pustules are chronic, and gradually burst or dry up into crusts. The hairs at first require force to extract them, and the root-sheath, which is often brought away, is oedematous. Later the hairs are loosened, and may fall or be permanently destroyed by deep infection. Another feature is the occasional formation of chronic nodules containing pus, or of abscesses. Again, when the malady persists, as it may do for many years, the picture is altered by the cohesion of diseased areas to form inflamed, infiltrated, diffuse patches or tracts, with indications of the formation of pustules on the borders, whilst the central parts appear devoid of hair, and only shew occasional pustulation, oozing, and crusting. Marked cases with this feature have been described as *lupoid sycosis.* More or less scarring may result with permanent loss of hair. Sometimes vegetations may occur and form sprouting masses as in other pustular eruptions. The

eruption tends to become more or less generalised on the hairy parts of the cheeks and chin, and not infrequently it affects the nostrils and upper lip arising from a staphylococcic rhinitis, and may cause considerable swelling of the lip. It is rare on the eyebrows, but the eyelashes may be infected from a dacryocystitis. It is uncommon on the pubes and in the axillae, and Besnier says that in the latter site a more frequent pustular adenitis of the sweat glands may simulate it, or it may be secondary to eczema. The course is essentially chronic.

FIG. 42.—Sycosis menti. (Copied from Willis's *Atlas*.)

**Prognosis.**—Spontaneous cure is rare, as this local infection tends to persist.

**Diagnosis** is usually easy when the characteristic peri-follicular pustules appear disseminated over the hairy parts of the face. Sometimes, however, the picture has been so modified by treatment or by crusting that the characteristic pustules are only seen by watching their progress. Their characteristic appearance may be closely simulated by pyogenetic ringworms of these hairy regions; but in such cases a careful search should be made for the broken-off stumps and for the fungus. Chronic pustular eczema may also give rise to some difficulty, but there is generally some definite evidence of it elsewhere. In long-standing cases of sycosis circumscribed vegetating patches may simulate ringworm.

and the diffuse infiltrated, sclerotic, or cicatricial areas of so-called lupoid sycosis must be distinguished from lupus vulgaris.

**Treatment.**—The difficulty in curing sycosis, as in the case of ringworm, depends on the deep implication of the follicle and the passage of the cocci outside, and on the resulting difficulty in getting an efficient parasiticide into contact with the infecting cocci. It is obviously necessary to open all the small abscesses, to remove all the pus, and to prevent auto-inoculation by applying one of the numerous disinfectant lotions, such as permanganate of potassium, peroxide of hydrogen,

FIG. 43.—Sycosis coccogenica (Unna). (From an illustration of Dr. Stopford Taylor.)

saturated solution of boric acid in alcohol, Eau d'Alibour of the French Codex diluted three to ten times with boiled water.

Epilation is largely practised; in the early stages of peri-folliculitis it is painful, but in the mature stage it is easy, and it often brings away the root-sheath and a considerable amount of pus.

Ointments containing mercury, β-naphthol, resorcin, sulphur, and carbolic acid are used to promote healing of the excoriated areas, to resolve infiltration, and to reach the cocci in deeper parts, which is rarely possible; and by long persistence a cure may be effected.

In recent years two valuable methods have been introduced; the judicious application of *x*-rays removes the hairs painlessly, and no doubt brings away many cocci, and favours the penetration of disinfectants. Pustules may form again, and if so the *x*-rays may be

repeated. The other method is the use of Sir A. Wright's staphylococcic vaccine which is sometimes very successful; an autogenous vaccine should be employed.

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Sycosis nuchae. — Syn.: *Sycosis framboesiformis* (Hebra); *Sycosis nuchae necrotisans* (Ehrmann); *Sycosis chéloïdien ou chéloïde de la nuque* (E. Besnier); *Acné chéloïdique* (Bazin); *Acné chéloïdienne* (Lailler); *Acné kéloïdique* (Vérité); *Acne cheloid* (Morrant Baker); *Dermatitis papillaris capillitii* (Kaposi).—The names given to this rare inflammatory suppurative peri-folliculitis of the nucha and neighbouring scalp of men illustrate the various phases which the diseased skin may assume in long persistent cases. In this connexion the plates published in Kaposi's *Hand-Atlas* are interesting. There is not an entire agreement as to the nature of the initial lesion. I have considered it here as a sycosis, but Sabouraud regards it as an acne on the ground that it starts from a true microbic seborrhoeic plugging of the follicles, and it is well known that the back of the neck is frequently the seat of acne vulgaris and furunculosis, or acné furonculeuse (Sabouraud). Kaposi, in 1869, thought that the disease did not commence essentially about the follicles, but that it was an idiopathic inflammation. The later phases are sometimes approached in persistent sycosis of the face.

**Etiology.**—It is peculiar to the male and generally begins in young adults. Ehrmann found the *Staphylococcus pyogenes aureus* and *albus*, and Sabouraud stated that these organisms are always present, but Darier considers that further research is necessary before this can be accepted. The back of the neck is the site of predilection.

**Morbid Anatomy.**—It is a peri-folliculitis with little pustulation, but with deep induration and with absence of the necrosis seen in the boil. It is probably a sycosis and not acne, though comedones are not uncommon in this site. The cheloid mass is formed of irregular fibrous bands enclosing round cells in the meshes. Dubreuilh described implication of the sebaceous glands.

**Symptoms.**—It begins insidiously as a nodulo-pustular pilo-sebaceous peri-folliculitis, with slight pustulation and notable induration. As the lesions gradually evolve they become crowded and confluent. After some years the infiltrated area may assume one of several phases; thus, vascular papillomatous vegetations (framboesiform) may arise, which bleed easily and exude an offensive secretion and pus in places. This phase may gradually give place to a sclerosis of the connective tissue, but the latter condition generally supervenes without the framboesiform stage, and a pale or reddened, shiny, nodulated, cheloid-like mass may be produced with destruction of the hair follicles in places, whilst others,

especially on the spreading border, give exit to tufts of hair (acne cheloid). This condition may be indefinitely prolonged for many years. Sometimes scars are seen. In Sir F. Eve's case the man had also sycosis of the cheek.

**Prognosis.**—It is a nuisance and disfiguring and persistent, but otherwise of little significance.

**Treatment.**—This is very troublesome. If seen at an early stage it may be treated like sycosis of the face. Framboesiform vegetations can be curetted away, and the wound kept as thoroughly disinfected as

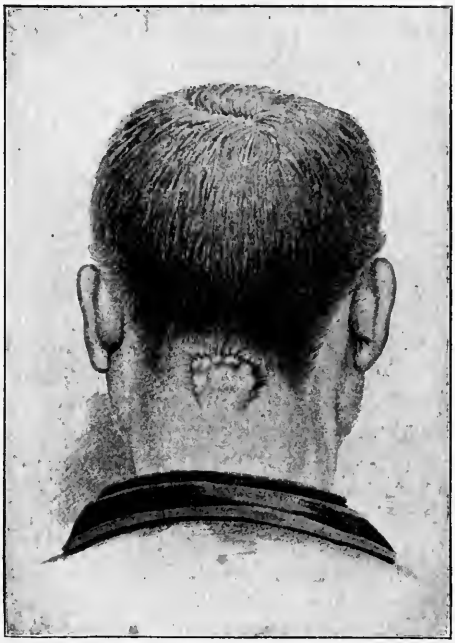

Fig. 44.—Acne Cheloid. (Sir F. Eve's Case.)

possible. When the cheloid growth is established a trial can be given to electrolysis, thiosinamine injections, profound linear scarification, punctate cauterisation, and lastly in all the phases the *x*-rays should be employed. After excision the growth has been known to recur.

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Boils.—The boil or furuncle is another phase of a more or less acute circumscribed peri-follicular suppurative inflammation caused by the *Staphylococcus pyogenes*; but it has special characters due to the deeper implication of the tissues and the larger area involved, and to the marked tendency to the formation of a circumscribed necrosis of the connective tissue, known as the "core" or "bourbillon" of the French. The lesion is usually first evidenced by the appearance of a firm painful circumscribed induration, with local reddening from congestion and projection of the skin. After some days the inflammation occasionally aborts, but usually the fight between the migrated leucocytes, aided by other influences, and the cocci ends in the production of pus, which after a time escapes by rupture of the roof of the abscess, and some of the pus may help to form a crust. The necrotic mass or "core" at the base of the crater gradually separates and is ejected, leaving on healing of the sore a cicatrix. The boil has a natural course of evolution and involution. An attack may be limited to a single boil, or several may appear nearly simultaneously. There is, however, a special tendency for others to form either in the neighbourhood of the first, as seen characteristically in some cases on the back of the neck, or at a distance; this multiplicity is generally due to auto-inoculation. In some patients there may be a succession of boils at irregular intervals over a large part of the body going on for months or years, and constituting the state characterised as *furunculosis*.

The site of the boils is determined by several factors, such as a neighbouring staphylococcic infection of the skin or mucous membranes, primary or secondary; by contamination of garments or other articles in use; by contact with other persons infected, and then often on exposed surfaces; by trauma, as about the buttocks of riders and oarsmen. As a rule there is little constitutional disturbance, but some malaise and febrile disturbance may be met with in susceptible subjects, and in rare cases septicaemia and pyaemia have been recorded. The related lymphatic glands may be irritated, and other cutaneous manifestations of staphylococcic infection may be seen. In certain sites, such as the face, there may be remarkable oedema of the parts. Two situations call for special notice; on the face, and especially the upper lip, there is a risk of venous thrombosis, and ultimately cerebral infection. In the external auditory meatus excruciating radiating pain may be caused, and there may be much constitutional disturbance.

**Etiology.**—This subject is of considerable historical interest. Before the causation of boils by the staphylococcus was established they were almost always attributed to constitutional disturbances, such as diabetes, gout, alcoholism and excesses, certain diatheses such as the lymphatic, to insufficient nourishment, chronic dyspepsia, and senility. There is no doubt at the present day that certain constitutional states, notably diabetes, do render the skin a more favourable soil for the growth and virulence of the cocci. Boils, however, may occur in apparently healthy people. The adjuvant causes have already been mentioned. Auto-inocu-

lation of boils by scratching, from person to person in people cohabiting, from patient to medical attendant, was noted by Startin in 1868. Epidemic outbreaks have been described, in families, in cavalry recruits from infected breeches, in asylums, and in ships, as recorded by Sir Gilbert Blane. Boils seem to be frequent in hot countries in the hot season, and may complicate sweat eruptions and probably be secondary to pustulating phases.

**Morbid Anatomy.**—The boil is the result of a deep inflammatory suppurative process ending in a small necrotic mass in the connective tissue, and is due to the *Staphylococcus pyogenes.* The eschar is riddled with leucocytes, and its centre contains a colony of the coccus. The suppuration may predominate or be freely added around the necrosed area. In all abscesses so caused the cocci tend to disappear or to die out. The boil is generally, but not invariably, formed about a pilo-sebaceous follicle, as it may form on the palms and on the part of the lip where no such follicles exist. It also occurs in connexion with the ceruminous follicles of the external auditory meatus. It may be borne in mind that the pilo-sebaceous follicle of a lanugo hair penetrates the superficial layer only of the cutis, and is connected with the panniculus adiposus by a column of fat (adipose column of Collins Warren), whereas the roots of the larger hairs are imbedded in the fat layer. The not infrequent repeated formation of boils on the back of the neck is regarded by Sabouraud as a boil-like inflammation originating in acne (acné furonculeuse).

**Prognosis.**—The boil is a local trouble, running a definite course, which, although annoying, is free from gravity except in rare cases. The size is of little importance. The distress caused by the boil in the external auditory meatus has been mentioned, and the possible gravity of a boil evolved on a vascular region like the upper lip or face in proximity to veins. In such a case great anxiety is aroused by the onset of rigors, atrocious headache, high temperature, followed by delirium. Exophthalmos may be caused by blocking of the cavernous sinus.

**Diagnosis.**—The typical boil is generally easily recognised. Malignant pustule on the face may be suggested when the lesion sets in with marked oedema.

**Treatment.**—As boils run a definite course, and in most sites without complications, and as it is almost impossible to reach the cocci by external applications, many of the forms of treatment advocated are futile and unnecessary. In the early stage, however, attempts are generally made to abort the inflammation by painting on tincture of iodine or ichthyol, or by applying mercurial plasters or unguents. Some inject carbolic acid (1 in 20), or corrosive sublimate (1 in 100), or silver nitrate (1 in 10), or use repeated sprays. Pain may be relieved by hot dressings of alcohol (95 per cent), saturated with boric acid. When pus is formed the summit is frequently incised to empty the abscess cavity, and attempts may be made to disinfect the crater by powders, such as iodoform, or by carbolic acid. There is still the eschar to separate, and this might, of

course, be curetted or burnt by the cautery. It is most important to take every precaution to prevent auto-inoculation by the pus directly or indirectly through the contamination of linen and other things. The surrounding skin should therefore be protected by some preparation such as iodine, and the dressings should be changed frequently. It is wise to wash the whole body carefully with a disinfectant. Boils on the face and in the ear may demand prompt surgical treatment.

*Internal Remedies.*—A careful examination must be made in order to correct any constitutional state, which may favour the evolution of the boils, or tend to make them more formidable. An old-fashioned remedy, which has been revived in France, is fresh yeast given in teaspoonful doses in a glass of mineral water thrice daily before meals. In recent years Sir A. Wright has provided us with a valuable remedy in the form of staphylococcic vaccine; its use is especially adapted for cases in which the boils are disseminated, and in which they are apt to recur.

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CARBUNCLES — SYN.: *Anthrax* (*bénin*) French.—This lesion was years ago confounded with what we now in Great Britain call anthrax or malignant pustule. The latter was distinguished clinically by Boyer, and by the discovery of its specific microbe by Davaine and by Rayer, but in France, unfortunately, the name anthrax is still applied to what we call carbuncle. The carbuncle is a bacterial infection of the follicles by *Staphylococcus pyogenes*, resulting in a mass of confluent furuncles, and consequently accompanied by corresponding greater local and constitutional disturbance. The follicular implication is not conspicuous clinically. Garré set up a carbuncle on his own skin by inoculating staphylococci from an osteomyelitis. On the other hand, in 1875 a case was recorded in which the attendants on a patient suffering

from a carbuncle on the buttock were inoculated with furuncles on the fingers and forearms.

The **etiology** is the same as that of boils, but clinically a carbuncle has a different aspect. An important feature is that the skin has become a favourable soil for the microbic invasion as the result of certain constitutional states such as diabetes.

The **morbid anatomy** corresponds essentially with that of the boil, but the inflammatory processes are apt to be deeper, more intense, and more extensive, owing to the multiplicity of the follicles involved. The

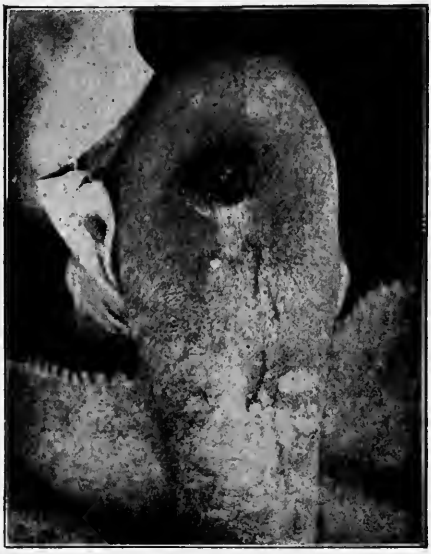

FIG. 45.—Small carbuncle and a pustule.

tissues separating the necrotic areas often undergo like destruction. More or less diffuse suppuration may occur beneath the necrotic mass.

**Symptoms.**—The earliest indications are generally slight febrile disturbance, malaise, headache, and backache, and sometimes shivering. About the same time the patient notices a painful red swelling of the skin, on which, it is said, blisters may form and rupture. The overlying skin gradually becomes perforated by a number of holes which exude pus, each leading to an eschar of the connective tissue. These eschars unite into a putrid mass of necrosed tissue, which in time separates from the underlying parts, leaving a vast crater which granulates and eventually heals with the formation of a scar. This is the simple circumscribed form; but in some patients with enfeebled resistance depending on senility or various complicating conditions such as diabetes, the inflammation is more diffuse, and is associated with grave constitutional symptoms. The inflammatory processes may extend enormously, and be surrounded

with a hard oedema associated with considerable collections of pus joining together in various directions. Such conditions may be accompanied with great prostration, apathy alternating with agitation, sometimes delirium, and death from septicaemia. The suppuration has been found to spread from the back to the spinal canal, from the abdominal wall to the peritoneal cavity, and ulceration has involved the great vessels in the neck. Thrombo-phlebitis may occur, especially in the face. In some old people and diabetics rapidly spreading gangrene may be established. Carbuncles may form almost anywhere, but the back along the sides of the vertebral column is a favoured site.

**Prognosis** will depend on the virulence of the organism, the resistance and age of the patient, and the absence or presence of complications, especially diabetes or Bright's disease. The site is of importance, for a carbuncle on the face it is a grave matter. The spreading of the suppuration may also give rise to anxiety, and the blood-vessels may be implicated.

**Treatment.**—Local applications are useless in checking the process. In some comparatively mild cases, or where an operation is refused or for various reasons is not undertaken, local applications, as for a boil, may be carried out (*vide* p. 196).

An operation, however, seems called for in most cases in order to shorten the duration of the process and mitigate its ravages. Many operations have been recommended, even removal of the whole diseased area. The crucial incision, and perhaps the removal of much necrotic debris and cleansing of the crater, are frequently practised, followed perhaps by the introduction of carbolic acid. This is not the place to discuss this matter fully, but the operation demanded must vary with the site, the size, the extent of suppuration, and so on.

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Multiple Abscesses of the Skin of Infants—**History.**—Lecerf in 1903 quotes Hervieux, who in 1853 studied 9 cases, and concluded that the abscesses were due to a purulent diathesis, an opinion which seems to have been accepted by Henoch in 1885. Bouchut in 1876 thought these lesions were caused by one of three diatheses, the syphilitic, the scrofulous, and what he called the puerperal, namely the condition in which infants had an erysipelas after birth, or the mother had puerperal infection. Escherich in 1886, and Longard in 1887, demonstrated the constant presence of staphylococci in the abscesses, as did Renault in 1898, and from this time the *Staphylococcus pyogenes* was established as the cause. The mode of infection was much discussed. Accoucheurs did not agree that abscesses were always due to exogenous inoculation of the skin, but they thought the deep abscesses especially might some-

times be due to a benign systemic infection brought about by the ingestion of microbes in the milk of mothers suffering from galactophoritis. Hulot and others, however, pointed out that these deep abscesses were not peculiar to suckling infants, and Lecerf in twenty-two cases noted two infants only who were being suckled, and these were infected long after cure of the mother's abscess. Brunier then suggested the possibility of an infection by sucking contaminated fingers, but Escherich and Longard had failed to find staphylococci in the faeces of nursing mothers suffering from galactophoritis, and, as a rule, the abscesses are not due to a systemic infection, though cutaneous and other abscesses may form in haemic infections. Renault observed a case of staphylococcic lumbar abscess with consequent pyaemia and deep dermic and other abscesses.

**Etiology.**—This uncommon affection is almost invariably seen in the infants of the poor, ill-nourished, badly fed, and in bad hygienic surroundings. The sexes may be equally attacked, and it is generally seen from about six months onwards.

The *Staphylococcus pyogenes* is the direct cause, entering the pilo-sebaceous and sometimes probably the sweat apparatus. The causal cocci may probably be already saprophytic in the skin, or inoculated from outside sources. Diminished resistance of the child's tissues seems to be a marked factor, depending on the age, antecedent and coincident diseases, such as tuberculosis, syphilis, and especially digestive troubles with bad alimentation. The neglect of proper treatment in the early stages is disastrous, and the exuded pus gets inoculated about. It is essentially a local infection, but in prolonged cases the child cannot combat the disease, and systemic infection or intercurrent disorders prove fatal.

**Symptoms.**—The abscesses characteristic of the state under discussion may form on all regions of the skin, but especially where the surface is constantly soiled, as the buttocks, thighs, and back; on places subject to rubbing as the occiput; and on uncovered parts. The abdomen and chest are more rarely involved.

Authors constantly mention the occurrence, antecedent to or concomitant with the abscesses, of an erythema with a vesico-pustular or papular eruption, which I take to be the *Erythema simplex infantum* of Jacquet.

As to number, there may at first be a single abscess or several, but, if not promptly dealt with, there is a tendency for their multiplication by auto-inoculation, and the more prolonged the attack the more numerous they may become, so that the whole body may be studded with one hundred or a hundred and fifty or more. They may be dermic in position, or in about a sixth of the cases hypodermic and subcutaneous. They form comparatively painlessly as circumscribed, indurated, inflammatory nodules from a pea to a nut or pigeon's egg in size, and freely suppurate without the formation of the "core" of the boil. They run a definite course, maturing and discharging their pus by rupture of the

skin, and then heal leaving a scar. The deeper ones can be felt in the skin, but take some time to involve the more superficial parts. In some cases, in which the nutrition of the child is enfeebled, the abscesses may leave obstinate ulcers or a fistula. As complications there may be pustular folliculitis, some lymphangitis, and, especially about the neck, inflammation of the glands, sometimes suppurative.

In slight and early cases there is little or no febrile movement, but with the progression of severe cases there is a toxaemia, and authors say this excites the pathogenetic action of the colon bacilli in the intestine. Gastro-intestinal trouble increases with loss of appetite and diarrhoea. The child becomes cachectic and prostrated, and bronchopneumonia or septicaemia may supervene and death ensues.

**Prognosis.**—The prognosis varies with the previous state of the infant and the extent of the infection. The milder forms are benign and yield readily to prompt treatment. In neglected children with poor resistance, in whom the infection has spread widely, the outlook is grave.

**Diagnosis** is generally easy, and the staphylococcus can easily be cultivated; but when the lesions are few it is well to remember that the abscesses may yield different organisms, such as the streptococcus in deep phlegmonous abscesses and *Bacillus pyocyaneus*. Syphilitic gumma is very rare in infants. The most likely error is the confusion with the cold tuberculous abscesses of rather older children; but these are often accompanied by other evidences of tuberculosis.

**Treatment.**—This consists in the prompt incision of the abscesses by the knife or, as some prefer, by igni-puncture. The craters can then be disinfected as far as possible and dressed with boric acid. Should healing be delayed, permanganate of potassium or perchloride of mercury may be used. It is essential to guard against auto-inoculation by dissemination of pus or by soiled linen, and for this purpose a disinfectant bath may be given daily, and the skin carefully cleansed. It is also most important to pay every attention to diet, and to the state of the bowels which frequently are or become disordered. As special remedies yeast and vaccines may be tried.

T. COLCOTT FOX.

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T. C. F.

# PITYRIASIS

By T. Colcott Fox, M.B., F.R.C.P.

**History.**—Sabouraud in his treatise on "Pityriasis et Alopécies pelliculaires," Paris, 1904, has reviewed all that has been said about this condition. In the days when the objective features were the almost exclusive means whereby diseases of the skin could be classified, Willan formed a group of *Pityriasis* (*πίτυρον*, bran), defined as consisting of irregular patches of small, thin scales which repeatedly form and separate, but never collect into crusts, and are not attended with redness or inflammation. He included a pityriasis capitis, known popularly as the dandruff, with semi-pellucid scales, especially seen in infants, and a pityriasis versicolor, which is now known to be caused by the growth of a fungus in the cuticle, and renamed tinea versicolor. Subsequently cases were universally noted in the scalp of adults, some apparently with dry desquamation, and others with varying degrees of massing of scales, which were more or less obviously greasy. In 1870 Hebra upset the current opinion by the introduction of a new etiological hypothesis, which was afterwards supported by Kaposi and almost universally accepted, causing an endless confusion. Hebra recognised a seborrhoea oleosa seu adiposa due to an increased formation of sebum (Acné sébacée of Biett, A. sébacée fluente of Cazenave, Seborrhoea of Fuchs), and included with seborrhoea Willan's dry desquamative type as S. sicca, holding that the forms of so-called pityriasis of the scalp were due to a disturbance of the function of the sebaceous gland-cells leading to the deposit on the skin of sebaceous gland-cells with fatty contents. The inclusion of the dry form was not accepted by all, and was especially contested by Pohl-Pincus in 1865 and 1867, and by Piffard and van Harlingen in America, who demonstrated that in this form the bulk of the desquamating cells were of corneous origin. This opposition, however, made little headway. Meanwhile it had been observed that in cases of pityriasis capitis superficially inflamed patches might be formed about the face and elsewhere, apparently of the same nature as the affection on the scalp; and a special eruption of the chest and interscapular region, described under various names, and long known at the Blackfriars Hospital as the "flannel rash," was also connected with pityriasis of the scalp, and this was especially pointed out in England by J. F. Payne, myself, and others. It is important to realise that the same disease may present a different appearance on the scalp and on other regions. This is also illustrated in the common ringworm and psoriasis. Inflammation must be comparatively intense to shew clinically patches of red congestion on the scalp. In 1887 another epoch was started by Unna, who stated that the

so-called seborrhoea of Hebra was not due to functional disturbance of the sebaceous glands, but that the greasy appearance of the scales was caused by oil supplied by the sweat glands. He held that there was a true fatty hypersecretion by the coil glands (seborrhoea oleosa, or better hyperidrosis oleosa). All so-called dry seborrhoeas were superficial chronic inflammatory processes of the skin; and in consequence of oil formed by the sweat glands permeating the lymph spaces and the whole of the cutis and epidermis, the desquamating scales were greasy. This inflammation was histologically a catarrhal inflammation of the skin, in which the sweat glands shared. He called the process an eczema, and qualified it by the adjective seborrhoeic (eczema seborrhoeicum). He further described the frequent implication of the face, body, and limbs, with lesions of different aspects, and though he failed to convince the majority that the oil came from the coil glands, his clinical description was widely accepted before he further expanded it. As will be seen later, Sabouraud holds that the serous exudation gives a similitude of grease in the scales, and what oil there is can be otherwise accounted for by the presence of Sabouraud's seborrhoea oleosa, and the probable production of a special fatty substance in the formation of the epithelium. Various authors try to avoid the confusion with true eczema by calling this malady *Dermatitis seborrhoeica* or *Seborrhoeide*, but the notion that the sebaceous glands are responsible is not obviated by these titles. It is evident that the name *Pityriasis* does not apply to many phases of this disease.

**Etiology and Pathogeny.**—There is much difference of opinion as to the age at which this affection can occur. Some think with Unna that it may commence in the scalp in early infancy, and that a large proportion of the so-called common infantile eczema is the malady under consideration, and that the lesions are easily eczematised. It is certainly striking that the infantile eczema nearly always begins on the scalp and descends over other regions. Sabouraud, who does not accept Unna's generalisation, says it may commence in the scalp about eight or ten years of age, and is exceptional in earlier years. Robert Willis in his Atlas gives an interesting portrait of a child's head with pityriasis, and I certainly believe that it occurs in children. In adolescents pityriasis capitis is very common. The special phase on the upper trunk may occur in both sexes, but more frequent in the male. This particular form is especially seen in those who wear flannel or woollen underclothing next the skin, often both night and day, hence the name "flannel rash." I have never seen it in children. Other forms of pityriasis may be seen at all ages, and often in children, and more or less generalised.

It is hardly necessary to discuss the old views about the constitutional states formerly thought to play a causal part. It may of course occur in various classes of patients, but there is no definite type of ill-health associated with it. Repeated observations have proved that it is not of sebaceous gland origin. Modern researches shew that it is probably a superficial dermatitis caused by certain microbes; and probably the dry pityriasis of the scalp is due to a microbe discovered

by Malassez in the scales and the upper follicle in 1887, and redescribed by Unna. It is known as the Flaschen- or bottle-bacillus, and named *Pityrosporon malassezii* by Sabouraud (*vide* p. 8). It is constantly present in great numbers in the scales of true pityriasis as distinguished from desquamation secondary to various processes. It is extremely polymorphic, but these phases are associated with one another. Sabouraud describes spheres, elongated forms (*en banane*), strangled forms (*en gourde*), and budding phases recalling yeasts. He thinks it is probably a degenerated involution form of the coccus with which it is associated. It has never been cultivated. Unna was the first to mention the presence of cocci; a few may be seen isolated in the dry pityriasis, but in the steatoid phases they are present in great quantities. Sabouraud says that if dry scales are swept by a sterilised brush into Petri dishes containing a thin layer of glycerinated agar-peptone, and placed in the incubator, in two days the surfaces become dotted with numerous small grey points. If opened after a few days the dish emits a peculiar butyric odour, and the points have developed into colonies of grey matter, intermixed perhaps with other kinds of organisms, such as a mould, especially penicillium, or a yeast, or a bacillus, or another coccus. The definition of this coccus giving grey cultures is not entirely easy. From the culture above described inoculations can be made in striae on tubes with agar-peptone, and next day the colonies are visible. They grow better on glucose-agar, and better still on glycerinated agar. It has not any special staining properties, but it differs from *Staphylococcus pyogenes*. It is the *Morococcus* of Unna.

In the "flannel rash" the dry follicular lesion is infected by Malassez's spore accompanied by a few cocci. It appears to be the cause of an excessive formation of corneous cells in the mouth of the pilo-sebaceous follicle. The follicular lesions with steatoid scale-crusts, covering the mouth of the follicle and forming a peri-follicular rim, are free from micro-organisms, but the follicular plug is full of them. As the lesions extend in surface, the scales are pure and dry, or there are scale-crusts. Numerous cocci are found where these crusts exist, but few bottle bacilli.

**Morbid Anatomy.**—Modern observers, such as Unna, Elliot, and Sabouraud, have shewn that the process is a superficial inflammation with the usual exudation of serum and emigration of leucocytes, and a hyperkeratosis of the corneous layer. I am not certain if a pure form of dry pityriasis simplex has been studied, but at any rate it has been proved that the scales come from a hyperkeratosis of the corneous layer, and that they are not derived from the sebaceous glands, as was formerly stated. The mouth of the follicle may be involved in this process.

The clinical features of the so-called steatoid pityriasis of the scalp have been variously explained. Formerly the greasy characters of the scale-crusts was attributed wholly to the hypersecretion of glands, and all except Unna thought the sebaceous glands. It must be remembered in this discussion that there are an immense number of these glands in the

Fig. 1

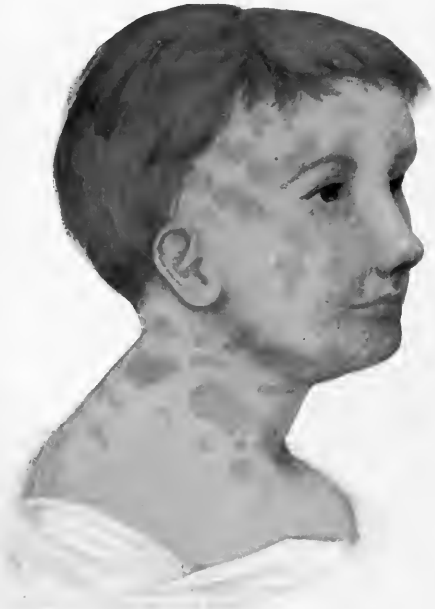
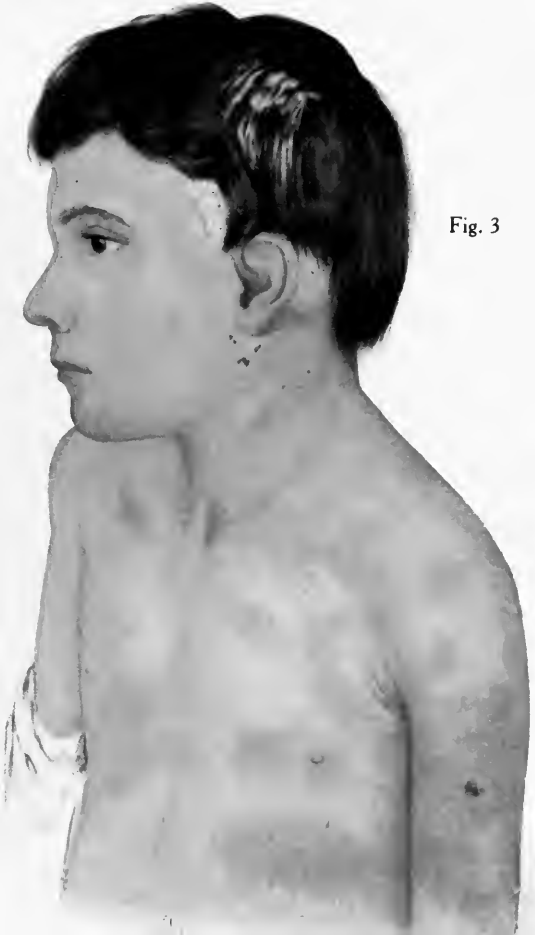


Fig. 2

Fig. 3



## PLATE II

FIG. 1

Impetigo pityrodes. Boy, aged 3 years.

FIG. 2

Pityriatiform eruption of uncertain nature. One patch "eczematised." Boy, aged 15 years.

FIG. 3

Pityriasis of the scalp, face, neck, body, and limbs. Girl, aged 10 years

neck and also on the chest and back. Sabouraud, who described an infective seborrhoea due to a micro-bacillus on the face, scalp, and other parts, points out that pityriasis may evolve on such a base. Lastly, modern research has shewn that the cutis and epidermis are permeated with an oil, which, according to Unna, comes from the coil glands, though others consider that it is associated with the epidermic formation. It is therefore difficult to settle the exact origin or origins of the fat present. Meanwhile Sabouraud has insisted that the serous exudation, rarely visible clinically, passes through the tissues to the exfoliating scales, and coagulates in places between them, and then for the most part is the cause of the peculiar aspect and feel which suggest grease. The same workers have investigated the "flannel rash," and what has just been written applies to this phase. Elliot found some signs of inflammation also in the deeper cutis, and alteration in the sweat glands. He agreed with Unna's conclusion, except in some details. They both found a curious degeneration of the rete cells with some mitoses, and a vacuole in place of the nuclei. This Unna thought pathognomonic, but Elliot does not. The papular formation is marked by increased infiltration of leucocytes and some connective-tissue cells. Elliot also failed to find the oil described by Unna in the cutis. Sabouraud also describes the formation of the "fatty" scale-crusts with serum formed over the follicles and around, and the papules appear from his description to be peri-follicular, as they look to be clinically. There is the form with dry scales and "fatty" crusts as in pityriasis of the scalp. The bacteriology already described is similar in the scalp and in the "flannel rash." The drier the pityriasis, the more abundant the spores of Malassez and the rarer the cocci; whereas the more "fatty" and humid the scales, the more numerous are the cocci.

**Symptoms.**—If we include eruptions on almost any part of the skin the symptoms will vary considerably within certain limits (*vide* Plate II., Figs. 2, 3).

*The Scalp Eruptions.*—These have been known as pityriasis, and later under different names such as seborrhoea and eczema seborrhoeicum. This very common eruption evolves insidiously, and does not occasion any trouble, except sometimes from itching, especially in heated rooms; attention may also be called to it by the annoyance of scales falling on the shoulders, but it often passes unnoticed until pointed out by a medical man. It pursues a chronic course, and after apparent cure it may return. It commences in certain points, which extend eccentrically to form more or less circular patches, and these join and finally tend to involve the greater part of the scalp. The hair loses its lustre, and becomes dry, and frayed at the ends. Unna attributed this symptom to blocking of the pilo-sebaceous follicles by scales. A thinning of the hair and more or less baldness eventually takes place, known as alopecia pityrodes. Several phases have been described which are of interest. Thus, Unna gives three: (*a*) a form characterised by dry scales, which may persist as such with increasing desquamation, or slight greasy feel of the

scales. This stage may cease and give place to a hyperidrosis oleosa. (*b*) A second phase in which the scales are increased and heaped up into crusts, which are fatty; in such cases it may extend somewhat on to the forehead as a reddened zone, and to the temples, ears, and neck, or

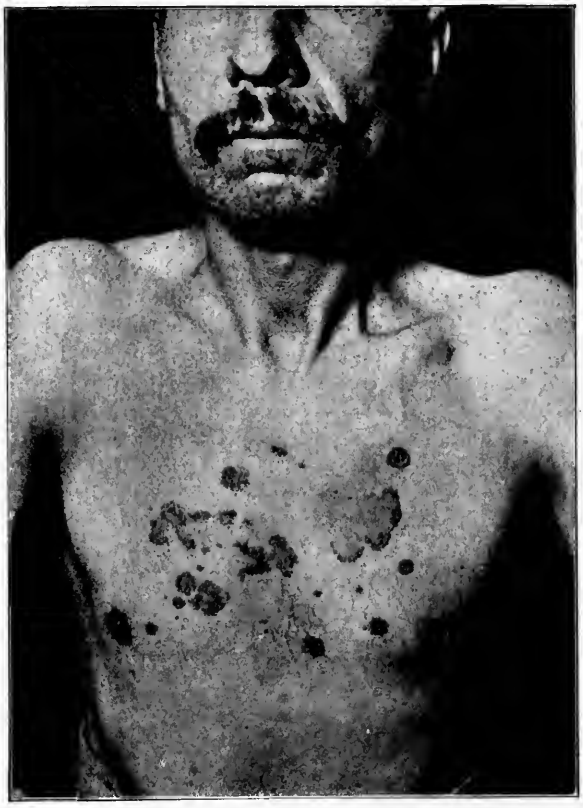


Fig. 46.—Pityriasis figuré, "Flannel rash."

nose and cheeks. (*c*) A phase characterised by catarrhal appearances, and even some oozing of serum.

Sabouraud emphasises two types: (*a*) pityriasis simplex with perfectly dry scales and without any clinical signs of inflammation is present and forms the earliest stage. The scales may be powdery, lamellar, or furfuraceous. It begins in pityriasic dises, round or oval, attaining three millimetres in diameter, entirely covered with a uniform thin pelliele, dry and retained by the hairs. This evolution chiefly occurs in children. Circination may be seen with scales on the borders, but absent from the centre. (*b*) Under the term pityriasis stéatoïdes he includes various cases of pityriasis characterised by the formation of thick scales apparently

fatty. The scales here are not dry and semi-pellucid as in pityriasis simplex, but opaque, often somewhat soft and thick, or they look or feel distinctly fatty or pasty, or a half-concreted oily element may predominate, or the concretions may seem waxy. The pure scale feature has been

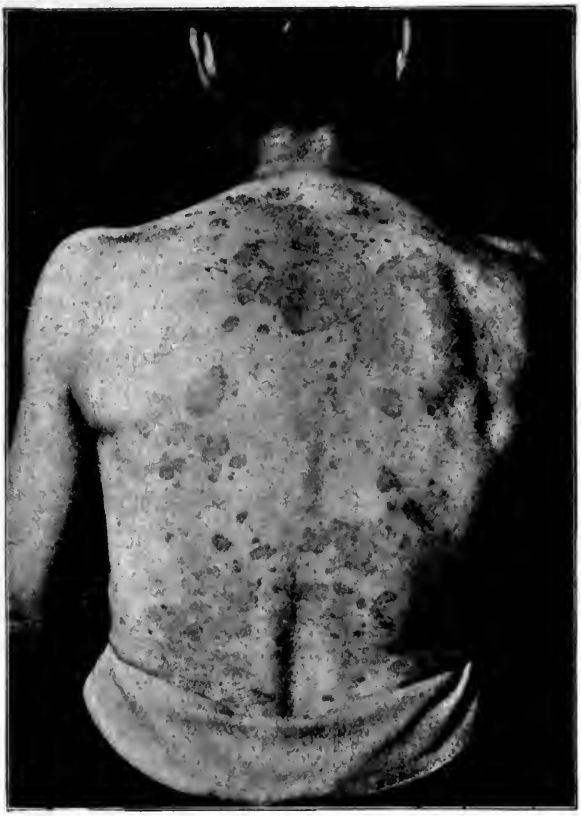


FIG. 47.—Pityriasis figuré, "Flannel rash."

supplanted by the crust. All grades of transition occur, and there is a progressive tendency towards the apparently greasy stage. Serous exudation is not usually visible to the naked eye, but is an integral factor in all cases of pityriasis stéatoïdes, and the cause for the most part of the apparently greasy condition of the scales.

*Figured Steatoid Pityriasis of the Chest and Back.*—This characteristic eruption has been described under various names. The peri-follicular papule formation with eccentric spread gave rise to such names as lichen circumscriptus (Willan and Bateman); lichen annulatus serpiginosus (E. Wilson); lichen marginatus (Liveing); lichen acnéique (Weyl); and lichen circinatus. Those who saw some affinities with eczema designated

it as eczema flavum, eczéma acnéique, eczéma circiné, and a phase of seborrhoeic eczema (Unna). Those again who regarded it as a seborrhoea called it seborrhoea corporis (Duhring), and seborrhoea papulosa seu lichenoides. Lastly, J. F. Payne suggested circinaria.

This phase has characteristic sites of predilection on the upper part of the back and on the chest. It begins by the evolution of isolated red miliary papules, due to a mild peri-folliculitis of the dilated mouths of the pilo-sebaceous ducts, which often contain a plug of corneous cells. These papules are apt to be capped with opaque, yellowish scale-crusts, which, however, are readily removed. A hair may be seen issuing in the centre. These papules then tend to enlarge centrifugally. They may join with similar discs, and they have a peculiar disposition to excite peri-follicular papules as they go, so that such papules may be left for a time in the areas, or be seen dotted along the borders. By further extension and confluence large tracts may be involved, or polycyclical figures may form. A characteristic feature is that these patches lose their redness in the central parts, and assume a peculiar tawny colour, while their borders remain red. This eruption may be dotted about, or may eventually occupy a great triangular tract, with its base across the tops of the shoulders to the arms and its apex below the angles of the scapulae. The different details of the picture presented vary with the predominance of papules, the presence of large areas which have assumed a tawny tint suggestive of tinea versicolor, and sometimes the irregular, patchy distribution with or without marked scaling or crusts. I saw a case in which the whole upper back was diseased in a great triangle with the tint of tinea versicolor, and a number of miliary papules on the borders. Pityriasis capitis exists in the majority of cases, and sometimes other phases of the disease are present elsewhere.

*Extension to other Regions.*—When the eruption extends to regions other than the scalp it is characterised clinically by evidences of dermatitis, especially a reddening of the diseased sites. This change in symptomatology resembles that seen in common ringworm and in psoriasis, for a certain intensity of inflammation is necessary to shew on the scalp as red patches. In the next place, there is much difference of opinion as to the eruptions of the glabrous skin that should be included. Everybody is familiar with the association of pityriasis of the scalp with a red superficial dry exfoliative eruption of the forehead and temples, sometimes extending along the upper border of the forehead, the eyebrows, sides of the nose, and neighbouring cheeks, the beard region, and ears. Small scales may be seen along the eyelashes, and there is a well-known patch which tends to form on the nape of the neck and just in the hair, which may be thickened and lichenoid from rubbing and scratching. It is generally admitted that a special eruption, popularly known as the "flannel rash," and occurring on the chest and upper back, and described formerly under many names, is another phase. With this eruption I and others have recorded dry red scaly patches in the axillae and on the limbs. According to Sabouraud, pityriasis, as he describes it, is localised nearly

absolutely to hairy regions, with the exception of the upper part of the body and some parts of the head. Unna, on the other hand, includes a large number of eruptions, with an evolution commencing in the head and spreading downwards over the body and limbs. Without going so far as Unna, I am of opinion that some eruptions on the body and limbs, often in association with pityriasis of the scalp, are essentially of the same nature. If this be true, it is evident that the name pityriasis is inadequate. There is a strong objection to the name *eczema*, and the term dermatitis or seborrhoeide has been substituted. The disease is not, however, due to seborrhoea, and therefore the name seborrhoeide and also the qualifying seborrhoeicum are unsuitable (cf. pp. 301-302).

The eruptions now referred to are dry, indolent, superficial, and of two orders, as seen in the "flannel rash." They may be characterised by miliary follicular papules tending to aggregate into patches of various sizes, and to cohere and form almost diffuse patches with follicles on the border; or macules form, generally with eccentric spread to make large patches, or they clear in the centre, and extend by a wide border. There is rarely any well-marked infiltration or elevation of the surface. These are of a delicate quiet red colour, and the greater part of the surface may be of a tawny tint. Scaling is not prominent as a rule, and itching is not a well-marked feature. I think the follicular type must be the eczema folliculare of Neisser. The flexures in children are the sites of predilection. It is very important to note that such eruptions are very liable to eczematise secondarily, and become almost indistinguishable from true eczema.

*A Special "Seborrhoeide" of the Face.*—Dr. Pringle and I have described an uncommon eruption of the face accompanied by a flushing of the region. It is characterised by innumerable red, aggregated, miliary, indolent, peri-follicular papules. They may acquire a darker tint, and traces of minute atrophic spots may be seen. I noticed on pressing out the congestion a peculiar citron-yellow base. This eruption yields readily to sulphur ointment.

**Diagnosis.**—There can be little difficulty in the diagnosis of pityriasis of the scalp. It need only be stated that very early macules of ringworm may be indistinguishable clinically until the hairs are diseased in a patch. Pityriasis of the chest and back is also very characteristic when once studied, and it need only be added that the old patches and sheets of disease may have a tawny hue, which suggests tinea versicolor, as the situation may do, but there are generally other phases to give the clue.

Great difficulties arise in the diagnosis of the disease in other sites. Clinically, we generally are led to include them with pityriasis when the scalp is diseased, or they are accompanied by the "flannel rash." In addition to these eruptions streptococcic impetigo pityrodes, which is generally confined to the face, may possibly be more widely spread. We also not infrequently see localised or more or less generalised eruptions characterised by reddened, superficial, indolent patches with or without adherent small scales, or built up of confluent miliary lesions of peri-

folliculitis. In the absence of any suggestion of pityriasis by the presence of that condition on the scalp the diagnosis is very difficult, and they may be regarded as dry eczema, a seborrhoeide, or eczema seborrhoeicum. Some eruptions are refractory to treatment and are evidently of a special nature. They are often called erythrodermia. Again, such patches may suggest a slight degree of psoriasis (*vide* p. 387). In the adult we must remember the early stages of mycosis fungoides, and perhaps in a patient coming from the tropics the early macular eruptions of leprosy.

**Treatment.**—The lesions, as a rule, readily yield to external applications, of which sulphur is probably the best, and most efficacious in the form of ointment. The medium, however, in which the curative agent is used must depend on the site of the disease and on the patient. Thus, women may object strongly to greasy applications to the scalp, and liquid applications are far more agreeable; still, in severe cases, pomades are sometimes imperative. In such a superficial dermatitis a host of parasiticide remedies have been recommended, care being taken not to over-stimulate. Thus, for the scalp, after a preliminary and judiciously repeated washing with soap and water—and I like Packer's tar soap—a lotion is systematically rubbed in containing carbolic acid, lysol, formalin, alcoholic solution of coal tar, or mercurials. I often use the following:—Biniodide of mercury 10 grains, solution of sodium iodide (one in four) ℥ss., liq. carbonis detergens ℥j., ol. ricini, ℥j. dissolved in rectified spirit, and aquam mellis to ℥vj., to be applied daily to the scalp. If the affection is obstinate, a little sulphur and salicylic or resorcin ointment is desirable. On the glabrous skin the same class of remedy is used, and a sulphur ointment is nearly always successful, but should it prove irritating resorcin and salicylic acid ointment may be tried.

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## BOTRYOMYCOSIS

SYNONYMS. — *Bourgeon charnu pédiculé; Muco-vesicular fibro-papilloma* (Bosc and Abadie); *Granulomes à pédicule bénin* (Frédéric); *Telangiectatic Granuloma* (Kuttner); *Granuloma pyogenicum* (Hartzell).

By T. COLCOTT FOX, M.B., F.R.C.P.

**History.**—Veterinarians have long observed growths of rapid formation on the wounds left by aseptic removal of the testes in the horse (*champignon de castration*), and often debris of the epididymis may be left. The growth may spread locally, and sometimes generalises. A section shews large twisting canals containing yellowish granular masses smaller than those of actinomycosis. Bollinger, in 1870, called this malady *Botryomycosis* (*βότρυς*, a cluster of grapes). These yellow masses have been explained in various ways. They were ascribed to abnormal development of microbes in glandular tubes, though never cultivated, and to a special process of degeneration of microbes. In 1900 Poncet and Dor of Lyons held that these muriform masses were due to the agglutination of peculiar spheres originating in the nuclei of the cells, and enlarging to occupy the whole nucleus, while the cell protoplasm diminishes, and

finally only the sphere remains. Staining shews that it has all the characters of chromatin; it resists decoloration by alcohol after fixation by iodised potassium iodide, and is well displayed by methylene blue followed by picric acid. The masses are not always discovered. Further, a coccus was often found, disseminated or in groups resembling grapes (*botryococcus*), which cannot be differentiated from the *Staphylococcus pyogenes*.

In 1897 Poncet and Dor called attention to small, benign, red, raspberry-like, pediculated growths in man, occurring especially about the hands, and regarded them as identical with the botryomycosis of the horse, because they contained muriform masses (botryomyces), and in the same year, in the Netherlands, Farer and Ten Siethoff described the yellow grains in a suppurating focus in the eyelids. Legroux, in 1904, pointed out the curious repetition of the bacteriological history in the animal and human diseases. At first the animal disease was attributed to a fungus (botryomyces), allied to actinomyces; next to a micrococcus (*Micrococcus botryogenes*), subsequently identified by many, though not by all, as the *Staphylococcus pyogenes*. The histology of the growths in man has given rise to much discussion. Dor came to the conclusion that the animal disease was a glandular tumour arising in connexion with the epididymis, and that the human growth was a fibro-adenoma of sweat glands. The sweat glands are often absent at the base of the pedicle, but it is suggested that the tumour may be removed above this part. This view, however, was abandoned, and the opinion prevailed that histologically the growths were closely like "bourgeons charnus," with various microbes of suppuration present, without any proof that they play a special part in the causation of the growths. Lastly, Letulle in 1908 described the disease as caused by amoebae, and this was confirmed by Labbé.

**Etiology.**—These growths have now been recorded at all ages, even in children, and as late as seventy-two years of age. They attack the two sexes almost equally. There is nothing very special to note as to the occupation of those attacked, except that they are persons, such as farm labourers, liable to slight injuries. The growths nearly always occur on an uncovered part; thus the hands, especially the fingers, are most commonly the seat; then the head, where it has been seen on the lower lip, eyebrows, ears, forehead, cheeks, and even on the scalp; rarely on the shoulder, and once on the sole of the foot. In about half the cases a history of some slight injury has been obtained, and in such cases the growth seems to start within a few weeks. About 100 cases have now been described, but little attention has been given to its occurrence in this country. The growth is nearly always single, and one case only, a man, shewed a lesion on the lower lip and later another on the hand (Delore). There is no evidence of contagion from animals.

**Morbid Anatomy and Pathogeny.**—A vertical section of the pedicle displays a compact fibrous stroma, which extends towards the tumour—like an opened fan. A striking feature of the tumour is the great number

of newly formed, thin and friable, capillary blood-vessels, suggesting in some respects an angioma. The cellular infiltration varies in different places and in different cases. The essential feature seems to be a multiplication of the connective-tissue cells. There may also be some mast cells, and a variable number of leucocytes and polynuclear cells, especially near the surface, which increase with the entrance of streptococci, and especially pyogenetic staphylococci. The whole picture corresponds to what the French call a "bourgeon charnu."

The *pathogeny* has been much discussed. Some observers have found altered sweat glands at the bottom of the pedicle, and it is important to secure the whole pedicle for the study of the growth. Influenced by the presence of relics of the epididymis in the animal tumours, many conceived that the disease in man is really an adenolipoma. But as the growth may form on the lower lip this interpretation has been abandoned.

We now come to the vexed question of the influence of parasites. At the outset Poncet and Dor considered the yellow granular masses found by them, which are very common in animals, and known as Botryomyces, to be the cause. These masses have only occasionally been found in man, and seem to occur specially in the base of the pedicle which may be absent in a section, and, moreover, they are said to form in a late stage of the growth. These observers, however, after a further research abandoned this view, and came to the conclusion that these masses were due to a peculiar cell degeneration, and it must be borne in mind that staphylococci may form muriform clusters.

The next hypothesis advocated that a coccus constantly found was a special organism (botryococcus). Dor inoculated this into an ass, and set up a like growth to that in the patient from which it was isolated. Further investigation, however, shewed that this coccus was the *Staphylococcus pyogenes*, and a secondary infection. Streptococci have also been found, and even the *Bacillus coli* and the *Bacillus proteus* and other organisms. It has gradually become widely accepted that this growth was simply a "bourgeon charnu" arising, generally, on an infected wound, and complicated with various organisms, especially the *Staphylococcus pyogenes*.

Lastly, a new hypothesis was put forward by Letulle in 1908, after a research carried out on material obtained from animals and human beings. He came to the conclusion that the disease was due to a special large cellular element with phagocytic power, which he regarded as an amoeba. He stated that these amoebae could unite to form the muriform masses. Labbé describes these masses as confined to the base of the pedicle, and perhaps spreading to a slight extent to the right and left along the peripheral zone. Most are in a state of hyaline or pigmentary degeneration. Several modes of reproduction are described. Those working at this subject should consult the details in the memoirs of these authors.

**Symptoms.**—The growth is benign and persistent. It appears as a

rounded, fleshy, framboesiform bud, projecting from the skin like a raspberry, some shade of red in colour, smooth or granulated or mammillated, and rarely lobulated. It is very vascular and bleeds easily. It exudes serum or pus, has generally lost its epithelial covering, is sometimes ulcerated, and may occasionally necrose away. These growths closely resemble the "bourgeon charnu" of the French, or what is popularly known in England as "proud flesh." A familiar example is the "raspberry excrescence" arising in vaccination wounds. They are purely local, do not generalise, and are rarely associated with any slight implication of the related lymphatic glands. They vary in size from about a pea to a nut, and are firm and elastic; Legrain, in Algeria, described quite a large tumour, but this requires confirmation. They are painless, do not itch, and are only a nuisance. They do not recur after removal. They differ from the ordinary "bourgeon charnu" in being attached to the underlying skin by a pedicle, which is more obvious on traction. They have thus a special morphology and a characteristic histology.

**Diagnosis.**—These benign growths are very characteristic, but may possibly cause some difficulty to the inexperienced with regard to an angioma, or papilloma, or early malignant growth.

**Treatment.**—This is very simple, as after cocainisation, if necessary, the little growth can be cut off. It is desirable to remove the whole of the pedicle.

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## URTICARIA

Synonyms.—*Cnidosis* (κνίδη, a nettle; κναίειν, to scratch); *Nettlerash.*

By T. Colcott Fox, M.B., F.R.C.P.

**Definition.**—An eruption characterised by a special process known as wheal-formation. Wheals, as exemplified by the local result of a nettle-sting (nettlerash), are circumscribed, firm, and elastic elevations or infiltrations of the skin, rapidly formed and more or less transient; due

to the sudden active congestion and collection of serous fluid in the dermis; and usually attended by remarkable itching, burning, tingling, or stinging sensations. It is a type of reaction to many exciting agents, and may appear as the essential eruption, or as a complication of other lesions.

**Etiology.**—Wheals are a symptom, a mode of reaction, due to various causes. There are three factors to be kept constantly in mind: first, a particular immediate cause, such as the sting of a nettle locally or the circulation of the special poison of diseased mussels, may be potent enough in any circumstances to excite an urticarial response. Secondly, agents ordinarily harmless will prove noxious, or a potent agent will be rendered still more effective, if the person have an idiosyncrasy favourable to the particular reaction. Thus, wasp-stings, strawberries, or iodide of potassium have been known to cause a generalised urticaria. Thirdly, in a large number of cases there is a neuropathic susceptibility, which may be hereditary or acquired. It may exist independently of the immediate cause of the urticaria, or it may be induced simultaneously. Such a nervous susceptibility may be part of the natural constitution of the individual, or be disclosed by some passing or continued departure from health, when it takes the form of a weakening of control by the higher centres, or of an exalted excitability of the vasomotor system. Sometimes the sensory nerves also are notably concerned (pruritus), independently of the eruption. It will, therefore, be readily comprehended that the causes, immediate, remote, and contingent, are often very complex.

The immediate causes comprise certain influences, which may radiate from the higher nervous centres directly or reflexly in response to stimuli arising in the skin, or in some viscus, or circulating in the blood; or possibly the peripheral centres may sometimes be involved alone. Their number is legion, sometimes simple and manifest, sometimes elusive. They may be in action momentarily, repeatedly, periodically, or persistently. They may be conveniently considered as follows:—

A. *External Causes.* (*a*) Vegetable.—The contact of certain species of urtica or nettle (U. urens and dioica) illustrates the type, and the immediate agent is said to be formic acid. No skin, however healthy, seems to be proof against the nettle. The down which surrounds the pods of cowhage (Heberden), and the squill (Galen), may also be cited as examples. The contact of a quinine lotion and of ipecacuanha (Newton Pitt) afford good examples of idiosyncrasy.

(*b*) Animal.—The attacks of gnats, mosquitoes, bed-bugs, harvest-bugs, dermanyssus, lice, and fleas often evoke wheals in the susceptible at the points of contact. The stings of jelly-fish, and of certain hairy caterpillars, such as the woolly bear (*Odonestis potatorum*), and especially of some of the genus *Bombyx*, are familiar examples. Dubreuilh gives three species of *Chenilles processionnaires* as producing the so-called *U.* endemica or epidemica. They live in communities and form compact nests, which they change at each skin-casting. One species makes a nest in the

moss at the foot of the *Pinus sylvestris*, another at the top of the branches of the *Pinus maritimus*, a third against the trunk. Certain dried secretions in the form of barbed hairs on the back of the caterpillar determine an urticaria, especially in persons who frequent the woods or disturb the nests; and it is said that animals and birds also suffer. These chenilles are a pest at certain times and in certain places. The bites of leeches applied to the sacrum, and the presence of a guinea-worm, have been known to produce the eruption.

(*c*) Mechanical.—Such a stimulus as a sharp slash with a switch, or whip-lash, may be powerful enough in itself to excite wheal-formation. Indeed Gull wrote that the susceptibility to wheal-production in response to a more or less forcible stroking of the skin with a pointed instrument is common in a greater or less degree to all persons, and can be called morbid only when extreme. The term "factitious" (U. factitia) is applied "to mark a form of urticaria which appears when the skin is rubbed or scratched, as distinguished from ordinary chronic urticaria, with wheals arising spontaneously." Such a factitious urticaria is seen in all acute cases in which a high degree of vasomotor excitability may be reached, and very commonly in chronic cases; it is a frequent complication of many pruritic dermatoses in which rubbing and scratching are induced. The formation of the wheal is usually associated with characteristic intense itching, burning, tingling or stinging; and at the same time the vasomotor system is rendered unduly susceptible to excitement, or such susceptibility already exists as part of a neuropathic state. The rubbing and scratching, even the contact of clothes, pressure, the changes of temperature of the skin, the wanderings of insects, and various excitements at other times, or in other persons, innocuous, tend to stimulate existing wheals, and to excite fresh ones in every direction. Thus in special cases the succession may be kept up although the immediate cause may have been slight or temporary. Some authors attach an excessive importance to this factor, and the principle has undergone great extension and development in France. Jacquet noted that when, in a case of acute generalised urticaria, a part of the surface is hermetically protected, the itching and wheal-formation cease in the part so long as the covering is applied. This would seem to shew that some external stimulus is necessary for the production of the wheal; but we must be cautious in our conclusions, for factitious wheals cannot be excited in all urticarial states. Some writers draw a distinction between U. factitia—now described as the wheal effect of an external stimulus acting on an excitable vasomotor system, which complicates a coexistent urticaria or other pruritic dermatoses—and dermographism or autographism, in which the vasomotor excitability, usually strongly marked, is the essential and primary condition. In the latter case wheals do not arise "spontaneously," but only in response to various external stimuli. Gull shewed that factitious urticaria could no longer be produced on regions where chloroform was dropped; Caspary, on the other hand, found that it could be excited even when the patient was

anaesthetised by chloroform. Dermographism may be produced on the skin in cases of hysterical anaesthesia, unilateral or generalised.

(*d*) Mineral substances are not much in evidence, but bathing in salt water is a frequent cause of wheals, and perhaps the influence of the exudation of salt sweat in the Turkish bath and otherwise may also be classed here. In a patient under the care of Sir Clifford Allbutt, the use of a little boric acid ointment (gr. xx. ad ℥j.) on the groins, to prevent intertrigo, was followed over and over again by a tendency to severe urticaria all over the trunk and thighs. The attacks were determined by the towel or other chafing. It was associated with acute erythema around and beyond the wheals, and with large areas of brawny skin. The cause escaped recognition for some time.

(*e*) Meteorological influences and disturbances of the circulation are frequently alleged as causes; such are exposure to cold or east winds, the change from a hot to a cold atmosphere, or, conversely, bathing of the face or hands in hot water, and changes in the circulation and exposure of the skin on removal of various articles of clothing on retiring for the night, or after getting warm in bed, or again on leaving the bed in the morning. The application of a cold body to the skin may excite a wheal, or the contact of an ice with the oesophagus. Such causes, however, are effective only in the presence of a neuropathic state, or, when from the circulation of certain irritating agents, the vasomotor system is unduly excitable.

B. *Internal causes* are often less susceptible of demonstration, and are often complex. They may act directly through the blood-current, or reflexly.

(*a*) Diet.—A very long list of dietetic causes might be given, comprising various kinds of tinned foods, fish, shellfish, pork, eggs, honey, mushrooms, cucumbers, berries and fruits, kernels and skins of nuts, and so forth; some difficult of digestion, some operative only in particular people and on special occasions. The mode of action is often difficult to determine. Urticaria occasionally ensues so rapidly that a mental effect has been supposed, or a reflex action through the nerves of taste. In the majority of cases the influence is a reflexion from gastro-intestinal disturbance; in others, again, some poison contained in the food, or manufactured in the canal, entering the circulation acts directly on the vasomotor centres.

(*b*) Disorders of internal organs (functional and organic). — The digestive system stands pre-eminently in the front rank. Quite apart from errors of diet, a weak or disordered digestion may lead to urticaria; and such digestive disturbances may constitute the primary factor, or be secondary to various constitutional states, such as anaemia or gout. Gull long ago discussed the influence of hepatic derangement in this direction. Too free eating and drinking are frequent causes, especially as alcoholism weakens the control of the nerve centres. Jacquet has observed a case of helminthiasis in the adult causing urticaria. Indicanuria has been reported by Sänger to be a frequent accompaniment of

this eruption. Probably in some cases a secondary haemic contamination is the immediate agent. So also disturbances connected with the genito-urinary organs by their action on the nervous system are nearer or remoter causes. The passing of a uterine sound (fifteen successive recurrences), or leeches applied to the os uteri (Rosenberg, Schramm, Scanzoni), may be cited as examples of such reflex action. The occurrence of urticaria in pregnancy (Hebra), in successive pregnancies (Saundby), or immediately following parturition apart from sepsis (E. Wilson), or in ovarian and subacute uterine irritation acting with a naturally sensitive nervous system at the menstrual epochs (E. Long Fox), or during the climacteric changes, may also be mentioned. Frank of Prague reports the case of a woman who at each menstrual epoch was attacked by a very severe generalised urticaria. Successful removal of an enlarged left ovary and thickened tube stopped all further outbreaks. Barduzzi and Pick have observed similar cases.

(*c*) Neurotic States.—The prominent part played by the nervous system in more than one direction has already been insisted upon; but occasionally a neurosis, such as hysteria, seems to dominate the scene; or at any rate the neurosis is very prominent, and the more immediate causes obscure. Nervous perturbations from sudden emotion or mental excitement may be noted as a cause. Urticaria has been recorded in exophthalmic goitre, in the area of the lightning pains of tabes dorsalis (Charcot), and in neuralgia.

(*d*) Blood Contamination.—Urticaria occurs as a premonitory, prodromal, or concomitant phenomenon in a great number of morbid states, acute and chronic (Besnier). The production of urticaria by the ingestion of various drugs in persons possessing the requisite idiosyncrasy or nervous susceptibility is well known. I may mention quinine, cinchonidine, sodium salicylate, chloral, santonin, pimpinella, guarana, potassium iodide.

Amongst toxic agencies are included the various serums. Lichtheim, Joseph, and others have met with urticaria during an attack of periodic haemoglobinuria, and Lichtheim notes that this eruption is a tolerably common sequence of the transfusion of the blood of one animal into the circulation of another (*vide also* p. 113).

It is now well known that the contents of hydatid cysts, from which Brieger has isolated a highly toxic material, passing into the pleura or peritoneum can cause urticaria; or, as it is said, on very rare occasions without rupture or puncture of the cysts (Dieulafoy): Debove produced it in two subjects by hypodermic injection of filtered hydatid fluid. Achard recites an instance of two operators being affected after a prolonged necropsy on a case of hydatid cyst.

There are many infective states of the blood any one of which may be the cause; and Besnier remarked that as with erythema multiforme so urticaria can shew itself during the prodromal stage, course, decline, or convalescence of diverse maladies, acute and chronic, especially the infective diseases. Its occurrence in the paroxysms of the intermittent

and remittent malarial fevers must be especially mentioned; this was pointed out in the eighteenth century by Cleghorn and Lionel Chalmers.

It is seen, like the scarlatiniform rash, in the different degrees of sepsis after operation, as after paracentesis, the opening of an abscess, an ovariotomy, or other abdominal section (L. Tait).

Gouty and lithaemic conditions must be especially noted, and rheumatism is said to be an occasional cause. Sir A. E. Wright has suggested that diminished blood coagulability may be a strong proximate cause, and he records the production of urticaria in dogs after the intravascular injection of peptone or leech extract, or crab or mussel extract. This leads us up to the subject of poisoning by various alkaloids contained in certain shellfish, and in tinned and other foods. The symptoms, both cutaneous and constitutional, are often severe, and the issue may be a fatal one. A distinction has been drawn between the effects of indigestion and the rarer true poisoning; but the symptoms described are too severe for mere indigestion. All sorts of mussels, and in all countries, and independently of particular seasons of the year, are at fault. Wolf localised the cause in the liver of the mussels. Salkowski and Brieger and others have isolated a poison named *mytilotoxin*; and Lustig detected a pathogenetic organism. "Auto-intoxication," from the intestine and other sources, has been alleged in recent years.

*Sex* has little influence on the incidence of urticaria, which may occur at any *age*; though typical urticaria, as seen in the adult, is decidedly uncommon in infancy (see L. urticatus, p. 241). In childhood I have met with the ordinary true and the massive urticaria, but in my experience it is less common in the child than in the adult.

**Histo-pathology.**—There is considerable difference of opinion as to the pathogeny and histology of urticarial wheals. Wheal-formation has been considered a vasomotor spastic disturbance, confined to the territory of the vessels concerned (vascular cone of Renaut), and "without any persistent histological substratum" (Unna). The oedema is non-plastic, and there is no trophic disturbance. Auspitz concluded that the wheal is produced by a reflex irritation from sensory to vasal nerves, causing paralysis of the vaso-constrictors or irritation of the vaso-dilators. Stimulation of sensory nerves was shewn by Loven, he says, to be capable of producing dilatation of the neighbouring arteries. This may be possible by means within the skin itself, as well as through the agency of higher centres. The microscope discloses a sudden and forcible oedematous dilatation of the lymph vessels and spaces of the deeper and middle layers of the skin, which, exceptionally, leads to vesication. Its force and sudden onset are seen in the stretching and rupture of elastic fibres. There is much difference of opinion as to the immediate cause of this acute oedema. Judging from the series of appearances observed in factitious wheals, it would appear probable, according to most authors, that a momentary spasmodic contraction of the vessels is followed by a temporary paralytic dilatation with stasis or retardation of the circulation and engorgement of the vessels, causing redness in superficial lesions.

The remarkable acute oedema either masks the congestion or causes anaemia by compressing the blood-vessels. Unna believes the oedema to be due to stagnation of blood brought about by a spasm of the larger veins, causing a sudden hindrance to the normal absorption of lymph by the venous capillaries. Gull and others considered that a spasm of the skin muscles is the essential factor. For the rest Unna describes changes in the blood-vessels met with in different degrees in all his eryanthemas; namely, increase of simple spindle connective-tissue cells in their walls, with increased volume of their nuclei; a few small mast cells, and thickening and deeper staining of the collagenous intercellular substance. Signs of inflammation are absent, especially leucocytes. Corpuscular diapedesis, however, is described in various degrees by most authors, and also engorgement of the blood-vessels. On the other hand, Gilchrist excised artificially-made wheals and found in sections of lesions of three minutes' duration fragmentation of nuclei, which seemed to mean death of cells preceding inflammation. In severe cases he found dilatation of blood and lymphatic vessels, migration of polynuclear cells with pronounced fragmentation, emigration of leucocytes, especially around the vessels, and increased serum. Török and Vas have found that the exuded fluid contains more albumin than that of mechanical oedema, and is analogous to inflammatory and not to angioneurotic oedema, as Heidenhain maintained.

**Clinical Description.**—Wheals differ in area, bulk, colour, and shape; hence, within certain limits, there is considerable variation in the objective features of the eruption in different cases. In *area* they are usually about that of a split pea or finger-nail, but authors describe them as being sometimes much smaller (see urticaria papulosa); on the other hand, they may cover an area equal to any of our coins, or, in rarer cases, form large welts as big as, or bigger than, the palm of the hand. So also the bulk varies, for, though as a rule superficial, they may form deep-seated, brawny, extensive infiltrations, or more circumscribed nodes (U. nodosa, U. tuberosa, U. gigas, U. oedematosa), all included under the name tumescent urticaria by E. Wilson. The old name, U. subcutanea, has been applied both to the deep-seated massive lesions and to pruritus without wheal-formation. The typical smaller wheals are distinctly circumscribed, project a millimetre or more, and are flatly convex, firm, tense, and elastic to the touch. The colour is notable, and has an intimate bearing on the pathogenesis: thus, when typical, they are of a white hue, often comparable to porcelain, wax, or ivory, sometimes set in an erythematous aureole; but they may remain in the early erythematous stage. The explanation given is that the wheal at first is red from active congestion, later more or less white; whilst during retrogression the reverse obtains. Usually, however, the evolution is so characteristically sudden that these stages of formation are not observable. In the more massive, deeper-seated eruptions this peculiar colouring is not so evident. Hirtz has observed the phenomenon of capillary pulsation several times upon the erythematous aureole, and Wilson

noted slow periodic variations of colour not synchronous with the pulse. The configuration of the wheal tends to be round, with the usual variations due to the different directions of tension in various regions of the body. Where, however, wheals arise in response to a mechanical irritation, such as scratching, a linear or other arrangement corresponding to the excitement is often seen. A wheal may arise singly, or the eruption may be scanty or copious, and then often confluent into large patches or sheets, covering the greater part of the surface. They are disseminated, and when grouped not according to any special plan. In the cases arising from internal excitements the wheal may be confined to one locality, or be generalised; or may characteristically attack different parts of the body without regular order or succession, and without special predilection for certain sites. The mucous membranes are liable to attack—certainly the nose, mouth, tongue, pharynx, glottis, and vulva; in these situations, as on the lips, eyelids, and foreskin, considerable oedematous swelling is apt to occur, and alarming suffocative symptoms may result, and even end fatally. It is generally conceded that the bronchial mucous membrane may be involved and a true asthma result, coinciding or alternating with outbursts of cutaneous urticaria. The implication of the digestive tube is less certain; but many authors, such as Guéneau de Mussy, accept the doctrine and thus explain certain intestinal attacks characterised by pains, diarrhoea (sanguinolent or not), melaena, or tympanites. Drs. J. J. Pringle and Hillier Chittenden have recorded cases of haematemesis suspected to own a similar cause, and Dr. Galloway has observed a wheal in a rabbit's stomach. Gull in 1859 said wheals could be formed in the stomach and intestines of a cat or dog, immediately after death, by passing a point strongly over the surface. Wheals have also been supposed to arise in the Eustachian tube and middle ear, and even in certain solid viscera, as the liver, and on serous membranes.

The history of the wheal is characteristic. It is sudden in appearance, fleeting and fugitive, comparatively so even in the more massive lesions. The only exception is in rare cases in which the individual wheals are persistent (U. perstans, a name not to be confounded with U. chronica). It has long been noted that certain wheals may persist an unusually long time, and that in rare cases the majority of the wheals may do so. The persistence of a wheal is so contrary to the usual temporary character that we rightly assume a critical attitude in accepting an urticaria perstans. Many cases, however, have been recorded and secondary changes have been described as fibrosis, verrucosity, etc. Boeck relates a case in which they persisted for three months, and disappeared under the administration of sodium salicylate, without leaving pigmentation. Morrant Baker exhibited a remarkable case at the Dermatological Society of London, in which persistent wheals appeared to undergo a fibromatous change, and Savill another. References will be found at the end of the article to some recorded cases, the nature of which is not thoroughly worked out.

Only exceptionally does any desquamation or pigmentation follow, but examples are recorded in which pigmentation had resulted apart from the results of scratching. Such cases must be carefully distinguished from the so-called U. pigmentosa (Sangster).

Haemorrhage may take place into wheals (U. haemorrhagica) as into other eruptions; and its occurrence often indicates renal disease, alcoholism, or some condition of like gravity. This subject is a very complicated one, as cutaneous haemorrhages may occasion some urtication *in loco*, and may not only infiltrate a wheal, but also form side by side with wheals. The distinctions between these conditions are sometimes very delicate and difficult; and the different phases have given rise to many descriptive terms and to as much confusion.

A rare phenomenon is the vesication of the wheal and the formation of bullae (U. bullosa). Sir S. Mackenzie, P. A. Morrow, and Kaposi have seen bullae produced in factitious urticaria.

Some authors (Kaposi, Duhring) hold that the wheal is capable of eccentric expansion, like a ringworm or E. multiforme; and in such cases ringed lesions may be produced (U. annulata, gyrata), the usual figured patterns being formed by intersection of the curves. Such cases are generally caused by blood-poisonings, but some authors refer such eruptions to E. urticatum [see also next paragraph, "Wandering Oedema"].

Besnier says that a variety of urticaria merits the qualification U. oedematosa (Hardy). The localised swelling, in situations where the connective tissue is lax, is sometimes very striking; and, further, a notable oedema of extensive regions, especially of the face, even simulating renal disease, accompanies the urticarial eruption which may be slight; but the name may be understood to apply to the occurrence of large, deep-seated nodosities and nodes, and extensive brawny infiltrations (urticaria with excessive volume). Reference should be made on this subject to the article "Angioneurotic Oedema" (p. 228). The overlying surface may be unaltered or reddened, and the characteristic disordered sensation is often absent. Such cases, which are seen in either sex and at all ages, have been considered distinct from urticaria; but ordinary wheals may be present also, and there are many intermediate forms. Certain regions, such as the face, limbs, or genitals, may be attacked, or any part of the surface, and the mucous membranes. The lesions arise like wheals brusquely, with or without prodromes, and attain their maximum in two or three hours. They last on an average twenty-four hours, and cause uncomfortable tension; or there may be antecedent pain. W. C. Brown of Penang has described (with others) a very peculiar phase, in which the oedema beginning in the feet and hands "wandered" up the limb, but the urticarial nature is questionable. There is no fever, but often intestinal colic, malaise, backache, somnolence, palpitation, constipation, vomiting, oliguria, and even albuminuria.

In the cases just mentioned, and in many other phases of chronic urticaria, a striking periodicity is observable, apart from malarial origin. The recurrence at stated times, as after a meal, or when heated in bed,

or when undressing, or leaving the warm bed, or at the menstrual epochs, may be easily explained; but the periodicity in other cases is more difficult to account for.

The attacks of urticaria may be momentary, repeated, periodic, or chronic; and the widely varying constitutional symptoms which may be present in different cases are more fully intelligible in the light of its causes. In the simplest examples, as from an insect bite or nettle-sting in a healthy person, a wheal arises at the irritated spot, and, after lasting a few minutes or hours, disappears without, as a rule, any multiplication of lesions by scratching. The ingestion of certain aliments or drugs, or the circulation of certain morbid products and other poisons, or occasionally the stings or punctures of leeches or insects, suffice in certain people, especially if they have a special idiosyncrasy, to determine a more or less generalised outbreak, usually of an acute character and with marked constitutional symptoms. Almost instantaneously, or after some minutes or hours, a widespread eruption of wheals occurs, perhaps in successive crops, with intolerable itching. After its disappearance in some hours, fresh outbursts may take place for a day or two with diminishing intensity. Such cases often present an independent pruritus and a more or less intense excitability of the vasomotor system which favour the turgescence of the wheals and the multiplication of others by the rubbing and scratching induced. The constitutional symptoms in such acute cases may be very prominent and grave. Preceding or accompanying the eruption there may be high fever, headache, backache, joint injection, coated tongue, loss of appetite, great thirst, nausea, vomiting, smart diarrhoea, and so on. In some blood-poisonings the issue may be fatal. In other circumstances, in which the causes leading to the urticaria are of a recurrent or more lasting character,—such as chronic dyspepsia or genital disease in women, or auto-intoxications,—the succession of wheals may be prolonged over weeks, months, or years. The individual wheals run their characteristic fugitive course, and come and go without apparent law or order; but the process, as a whole, is recurrent, relapsing, or chronic.

**Prognosis.**—Life is only endangered by the eruption in some rare cases in which important portions of the respiratory or upper digestive tracts are the seat of wheals; and, alarming as the symptoms may be, recovery usually takes place. It must be borne in mind, however, that urticaria is occasionally symptomatic of grave conditions, such as mussel poisoning, the infective fevers, and chronic mycosis fungoides. I have also learnt to be cautious in the presence of urticaria in elderly persons, as I have seen it prelude degenerative troubles connected with the blood-vessels of the brain and carcinoma of the viscera. Urticaria, as a rule, is amenable to judicious treatment; but some cases are extremely intractable, and cause the patient much misery.

**Diagnosis.**—Wheals in their typical forms are easily recognised by their appearance and consistence, their sudden evolution and fugitive course, and the accompanying characteristic disordered sensation and

distribution. Again, the eruption as a whole is uniform, irregular and apparently capricious in distribution, not selecting any special nerve territories or particular sites. In the presence of wheals we have to determine if a susceptibility to factitious urticaria exists; whether the wheals are the primary and essential eruption, or whether they are only incidental to or part of some other malady such as malaria, mycosis fungoides, septicaemia, or dermatitis herpetiformis; or a complication of some pruritic state, such as scabies, pediculosis, or prurigo.

Unusual forms of wheals, such as the giant or massive forms, may for a time occasion more difficulty, and may simulate phlegmons, erythema nodosum, acute leprosy eruptions, gummas, or sclerodermatous patches; but the ephemeral course of the wheals and their irregular occurrence will attract attention. Where diffuse oedema exists, erysipelas or renal disease may be simulated. The cases in which the oedema "wanders" up a limb are very curious. Further, the observer will bear in mind the remarkable amount of oedema which occurs where the connective tissue is lax, as in the eyelid, lip, and prepuce.

Acute cases from blood-poisoning may closely simulate erythema multiforme, and some drug eruptions, for example, that of copaiba.

Wheals affecting the tongue, nose, glottis, or other mucous membranes may occasion difficulty; but the usual concurrence of cutaneous wheals will generally afford the clue.

Lastly, it is quite common for patients to present themselves in the daytime without existing wheals, and with the signs of scratching only. The history given of an ephemeral itching eruption will generally give a correct clue. In rarer instances the irritation is so intense that the patient in a frenzy digs out the wheal to the size of the little finger nail, and comes before the practitioner studded with such excoriations.

The diagnosis of the cause is much more difficult. Periodicity may suggest a malarial origin, even in the absence of typical attacks. Nocturnal outbreaks should always lead to a thorough search for an animal origin.

**Treatment.**—The rational and often the successful treatment depends on the correct unravelling of the etiological factors, often in complex combination, including any undue excitability of the vasomotor system, or any possible idiosyncrasy. This done, our object is first to remove or suppress such factors as far as possible, and, secondly, to carry out a symptomatic treatment with a view to mitigate the effects by soothing the skin and relieving the disordered sensation. The second indication is often urgent.

*Internal Treatment.*—Acute urticaria is ephemeral, and usually demands no more than expectant treatment. When dependent, as is so often the case, on the ingestion of irritating substances, we may administer an emetic of zinc sulphate, mustard, or apomorphine, if the case be seen early enough; at a later stage purgatives and diuretics may be given to eliminate any peccant matter. It must be remembered, however, that acute urticaria may occur in association with grave blood-poisonings. Periodic outbursts should always bring to mind malaria, even though

the more characteristic features be ill-marked; when malaria is the cause the preparations of quinine are called for. Talfourd Jones says nothing gives such speedy relief as a hypodermic injection of apomorphine.

To discuss the treatment of *chronic urticaria* is almost to write an essay on the treatment of disease generally; the key must be found in a careful study of the causes. It will only be necessary here to point out the chief lines on which treatment proceeds, and to indicate some particular remedies of repute. The length of the list of methods and drugs recommended is due not so much to our ignorance as to the multitudinous and complex causes of the disorder.

Although nocturnal outbreaks will always suggest the possibility of an animal origin, such is by no means always the cause.

Derangements of the abdominal viscera, especially of the gastro-intestinal tract, are by far the most frequent causative conditions; and such remedies as aids to digestion, sedatives of the gastric mucous membrane, checkers of fermentation, cholagogues, and evacuants and disinfectants of the intestine, are frequently called for. Intestinal lavage on the Plombières system has been found useful in certain cases. The diet bespeaks careful investigation and regulation, and sometimes particular kinds of ingested articles, such as butcher's meat and alcohol, have to be wholly interdicted. Idiosyncrasy must be borne in mind. Gouty and lithaemic states are frequently in evidence, and blood contaminations, where they exist, often require elimination by the bowels, kidneys, and sweat. Urticaria may complicate acute rheumatism, and probably arises in other phases of rheumatism. Both in gouty and rheumatic states salicylate of sodium (gr. j.–ij. every hour, or gr. xv. ter die, in Vichy water) has proved useful. When the specific gravity of the urine was found to be low, T. J. Maclagan successfully administered colchicum.

The nervous system plays such a prominent part that it is not surprising to find that various nerve tonics have won a good reputation, such as nitric acid (Willis), strychnine in full doses, quinine in full doses, and sometimes arsenic; quinine given before the time for an attack is useful in periodic cases other than true malarial ones, and it should always be kept in mind that the malaria may be masked. Startin the elder strongly recommended quinine given with an alkali. As lesseners of nervous excitability may be mentioned tincture of belladonna in full and increasing doses, atropine (gr. $\frac{1}{150}$ subcutaneously at night, or night and morning, and cautiously increased, or in pill form), bromide of potassium, with or without atropine, and the analgesics antipyrin (gr. x.–xv. ter die, or gr. xx.–xxx. at bedtime), phenacetin, acetanilide. The continuous current has also been recommended for ten minutes night and morning, with the positive pole at the top of the spine and the negative at the bottom. Hypnotics are sometimes imperatively demanded, and are most useful in securing for the patient a quiet night, free from irritation and the exhaustion of sleeplessness. Fluid extract of ergot (Heitzmann and Morrow, ʒss. doses), ergotin, perchloride of iron, and hamamelis have been used to act on the vasomotor system.

With regard to the state of the blood, Sir A. Wright pointed out that many cases of urticaria are associated with defective coagulability of the blood, and in these cases he found a deficiency of lime salts (decalcification urticaria), and such cases are greatly benefited by the administration of calcium salts with care not to give the drug in excess. Amongst miscellaneous remedies may be mentioned tincture of strophanthus (Riffat), iodide of potassium (Stern), ichthyol (which Sir Malcolm Morris highly recommends), fresh tincture of aconite (Duchesne-Duparc), sulphuric ether (Trousseau, ♏ xx.–xl. in water), gelsemium, pilocarpine (Pick), and nettle tea.

Lastly, it may be said that some cases resist all treatment until a thorough change of scene and air is sought, and with this may be combined the active treatment of a suitable spa.

In massive swellings of the tongue and throat relief has been given by scarification; and it may be noted that in France it is a practice in "internal urticaria" to "recall" the eruption to the skin by dry friction or flagellation, artificial urtication, or a hot mustard foot-bath.

*External Treatment.*—The indications are to relieve the erethism and vasomotor excitability, and by this means, or independently, to allay the pruritus, and thus to remove the incitement to scratching and rubbing. Baths are not always useful. They should be given tepid and generally at night, and the skin should afterwards be dusted with powder. Starch, alkaline, vinegar, or sulphurated potash baths are in most request, but borax, sublimate, and carbolic acid are sometimes used. Lotions, sprays, powderings, and compresses are the usual forms of local applications. Besnier says it is often a mistake to apply cold lotions. Sedative astringent lotions may be most comforting; such as ℞ Subacetate of lead gr. vijss., dilute hydrocyanic acid ʒij., alcohol ʒiij¼, water to ʒj., or the well-known calamine lotion. Acid lotions may be applied, such as vinegar (1 part to 3 of water dabbed on with a sponge), or nitric acid (2 or 3 drops of the strong acid to a quart of water), or lemon juice. The French use warm carbolised vinegar (40 grams of aromatic vinegar and ½–1 gram of carbolic acid per litre). Evaporating lotions also may give relief, and it is well after a lotion has dried to dust on an indifferent powder. Other lotions recommended are perchloride of mercury (1 in 1000), benzoic acid, atropine sulphate (gr. j.-ij. to ʒj. of water), over limited areas with compresses, and ichthyol. Chloroform water, dropped on the skin, was first used by Gull; Neligan combined chloroform with cold cream (ʒss. to the ʒj.), and Hardy suggested 10 parts to 30 of oil of sweet almonds. Sometimes the pruritus is allayed by carbolic acid (♏ xx. in ʒj. of camphor water with spirits of wine and glycerin). Menthol is often ill borne. Kaposi gives the following prescriptions:—(i) ℞ Spirits of wine 200 grams, petrolic ether 5 grams, glycerin 2 grams, and spirit of lavender 100 grams. (ii) ℞ Rectified spirits of wine 150 grams, sulphuric ether 2½ grams, aconitine 1 gram; in either case followed by powdering.

Lotions, however, have a passing effect only and require frequent

application. A very useful method in many cases is the application of *occlusive dressings*, such as Unna's glyco-gelatin, and Sir Malcolm Morris's zinc cream, to be dusted over with potato starch when as dry as possible. Another simple application, recommended by Hyde, is to mix starch with cold water and boil until like thin mucilage; to a pint add one dram of zinc oxide and two drams of glycerin before ebullition is completed, and apply cold. To such occlusive dressings antipruritics may be added. In conclusion, it is desirable to protect the skin, as far as possible, from the air and any sources of irritation, and to avoid heated rooms, violent changes of temperature, stewing in bed, and any possible irritation by vestments.

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## ANGIONEUROTIC OEDEMA

SYNONYMS.—*Giant Urticaria* (Milton); *Massive Urticaria* (Rapin); *Urticaria oedematosa* (Hardy); *Acute circumscribed Oedema; Acute essential Oedema* (Étienne and Galliard); *Acute idiopathic Oedema; Acute toxi-neuropathic Oedema* (de Calvi); *Wandering Oedema; Quincke's Oedema.*

By T. COLCOTT FOX, M.B., F.R.C.P.

**History.**—In 1878 J. L. Milton published a memoir on 4 cases, summing up his conclusions presented in a paper read some years previously to, but not printed by, the Royal Medical and Chirurgical Society, and in a second paper published in the *Edinburgh Medical Journal* in December 1876. His memoir published in 1878 has a chromo-lithograph produced from a portrait now in the collection of the St. John's Hospital for Skin Diseases. Collins and Prof. Osler have given references to earlier observations, such as that of Graves in 1848. That the eruption must have attracted the interest of observers from time to time is evidenced by a letter in my possession from Lewis Shapter of Exeter in 1878 to Tilbury Fox, enclosing a photograph of a case under observation for two years, which he labelled as *Oedema nodosum*. It was, however, the publications of Quincke of Kiel and his pupil Dinkelacker, in 1882, which attracted special attention, and since that date there has been a steady record of cases.

**Etiology.**—This affection has in some respects close affinities with urticaria. It is not uncommon, and Prof. Osler observed 18 cases in his private practice in Baltimore, and 16 in the hospital. It may begin in earliest childhood, and as I write I have an infant under observation in whom it began at three weeks. It is most frequent in early adult life, rare after sixty, and tends to lessen with advancing age. As to sex, Cassirer collected seventy males to sixty-three females, Collins found in America that a third of the cases were in females, and Prof. Osler records 14 cases in females in his 18 private cases. It seems to be more prevalent amongst the well-to-do classes. In the history of the previous health there is little to be found bearing on the causation, and even at the time

of the attack many patients do not shew any special ill-health. Predisposing causes mentioned are: the menstrual epoch, hysteria, a melancholic disposition, and the existence of an intercurrent disease, such as Graves' disease. The oedematous swellings are supposed to be provoked by such agents as exposure to cold, to heat rarely. It is said to be more frequent in winter than in summer. Other exciting causes given are: trauma; certain idiosyncrasies in respect to drugs and food (fish and apple); nervous factors such as emotion from fright, anxiety, worry, overwork, insomnia, and mental weariness. It is curious that attacks are more likely to occur between 1 and 5 a.m.; and there is sometimes a notable periodicity. Neurasthenia, evidenced by migraine and neuralgia, are often present. Prof. Osler did not find that intoxications played any part, but some infections are sometimes present, such as rheumatism, tonsillitis, and malaria. Apart from the special symptoms produced by oedematous swellings in the gastro-intestinal tract many observers record digestive troubles; for example, Collins noted it in 34 per cent of the cases he analysed. Observers, however, do not agree that this is a prominent feature.

One of the most remarkable features is the heredity of many cases, and a number of members of a family may be attacked. Prof. Osler was one of the first to point this out by the record of twenty-two persons affected in five generations; gastro-intestinal crises were very well marked in this family. Of one hundred and forty-one persons in seven generations, in the remarkable family recorded by Dr. Ensor, forty-nine were affected (twenty-eight males and twenty-one females), and twelve died from suffocation caused by oedema of the glottis. The pedigree of Dr. Ensor's case (Fig. 48) is from Dr. W. Bulloch's monograph.

**Pathology.**—The oedematous swellings are regarded as of the nature of wheals and of vasomotor pathogeny, though the causes of this process are obscure. The swellings shew marked serous oedema with some leucocytes, and sometimes red blood-corpuscles. Is it a malady or a symptom-group like urticaria? "An affection, which breeds true through six generations, and in each presents identical features, seems worthy of a special designation," writes Prof. Osler. In a fatal case recorded by Halsted nothing to account for death was found at the necropsy, and he was inclined to attribute it to oedema of the brain. Prof. Wardrop Griffith in a fatal case found that the serous oedema implicated not only the mucous membrane but also the deeper connective tissue, and even the substance of the muscles.

**Symptoms.**—This affection is characterised objectively by the rapid formation in the dermis and hypoderm, and sometimes in the mucous membranes, of more or less circumscribed oedematous swellings, which disappear spontaneously in some hours or days without leaving permanent damage to the part. It is said that unusual persistence may lead to the formation of bullae. The swellings may be of the same colour as the unaffected skin, or dead-white, or waxy-looking, and sometimes colder to the touch, or at other times more or less reddened and hot. Rarely they are

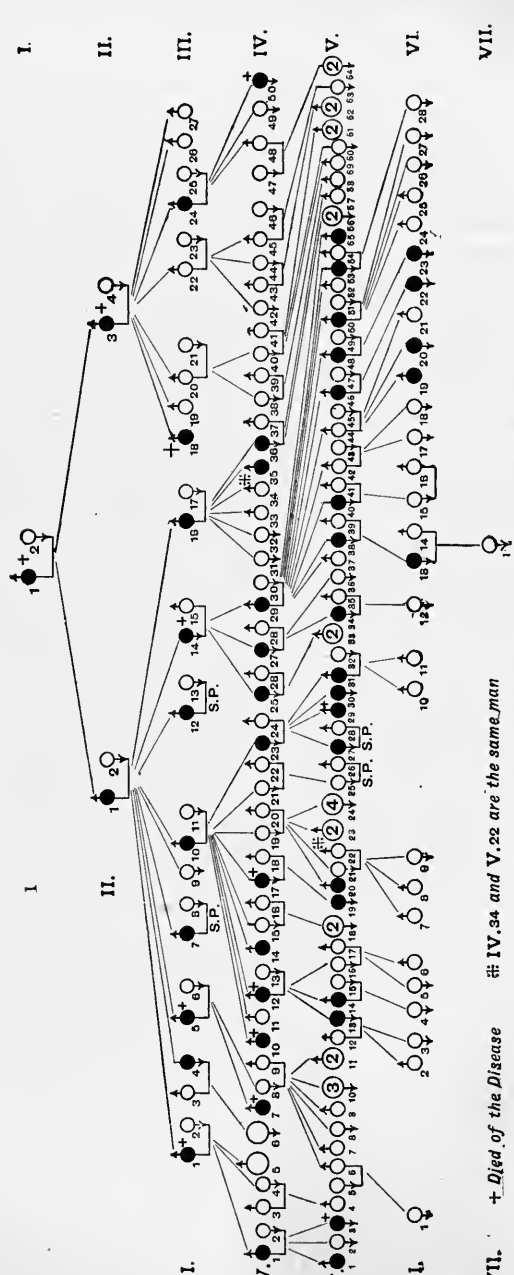


FIG. 43.—Pedigree of Dr. Ensor's cases of angioneurotic œdema. (Bulloch.)

ecchymotic. In consistence they are firm and elastic, and even hard, except sometimes in the declining stages, and in certain places such as the eyelids. In conformation they may vary in different parts of the body. On the trunk and limbs they may project like globular tumours, in size from a nut to an orange or more. On the face, genitals, and hands they generally form more extensive swellings. The hands, Prof. Osler says, may resemble light boxing-gloves, and on the extremities large areas the size of saucers may form. The arm has been described as so swollen that the sleeve had to be slit up. As to site, they can arise anywhere,

FIG. 49.—Acute circumscribed or angioneurotic oedema.

and are generally asymmetrical and widely separated, but the face, extremities, and genitals are the sites of predilection. They may be symmetrical on the backs of the hands, and the whole face may be attacked. The swellings may involve the lips, palate, pharynx, larynx, and even the stomach and intestine (*vide* Vol. VII. p. 87). The mouth or nose may be blocked, the eye covered up by oedematous skin, and the closure of the glottis may be distressing and alarming, and in a number of cases has proved fatal. Oedematous tissue has been recognised in the vomit, and oedema of the intestinal wall demonstrated at an operation for colic. The swellings may be solitary, or few and widely separated, or more numerous simultaneously or by successive evolution. Another feature is the tendency to recurrence at irregular intervals, or

periodically, and there is often a marked disposition to return in a given locality. Thus the eruption may continue for years, sometimes with long intervals, and rarely throughout life. It is said to cease in two or three years in half the cases. Subjective symptoms are often not marked, but there may be itching and a hot sensation, especially during evolution. The swellings cause discomfort from stiffness and tension. Constitutional symptoms are often absent, and the formation of swellings may be without apparent cause or warning, and may be discovered only on waking from sleep. When the mucous membranes are attacked more urgent symptoms arise, such as suffocation when the glottis is blocked, violent colic when the intestine is involved, vomiting in gastric attacks. The glottis and intestine may be attacked when there are swellings elsewhere. Under Etiology reference was made to many states of ill-health which have been noted where this eruption was evolved, but there are no definite accompanying constitutional symptoms peculiar to this condition. In some cases, before the evolution of the swellings, the patient may complain of feeling out of sorts in various ways, and during the attack there may be headache, sleepiness, vertigo, and depression. Haemoglobinuria, paroxysmal tachycardia, albuminuria, and eruptions, such as urticaria, erythemas, and purpura, have been noted.

**Prognosis.**—Many cases, especially the milder ones, run a comparatively short course, and, if the mucous membranes are not attacked, are only a nuisance. Occasionally discomfort and disfigurement and mental worry and depression ensue. However, there must always be anxiety in cases in which the mucous membranes are liable to be involved, and Dr. Bulloch notes that out of 170 undoubted cases death ensued from oedema of the glottis in 36.

**Diagnosis.**—Well-marked examples, with a history of former attacks, are easily recognised; but some cases cause difficulty for a time. In the first place, it may be very difficult to distinguish an urticaria with unusually large lesions sometimes described as urticaria tuberosa, if indeed they are distinguishable. Localised angioneurotic oedema has also to be carefully distinguished from a number of local oedemas accompanying neuralgia, tabes, menstruation, malaria, paralysis, hysteria, thrombosis, stasis, and cachexia. The angioneurotic oedema, however, is apt to be rapid in formation, transient, asymmetrical, and localised. It may simulate other affections, for instance, when it arises over the parotid, around joints, and over all the face like a recurrent streptococcic, non-febrile lymphangitis (*vide* Fig. 41). A very important point is the diagnosis of the cause of the gastro-intestinal crises with intense colic or vomiting met with in angioneurotic oedema.

**Treatment.**—As the etiology is so obscure, or perhaps it would be better to say complicated, various forms of treatment have been carried out, but with little success. It is therefore necessary to investigate carefully the general state in order that any departure from health may be combated and the patient placed in favourable conditions. Prof. Osler has little confidence in special forms of dieting; but in cases with obvious

gastro-intestinal disturbance, apart from the symptoms due to oedema of the stomach or intestine, dieting and suitable treatment are desirable, including the proper action of the bowels and kidneys. Where a neurotic state is present, quinine and arsenic, in increasing doses, may be given, or strychnine injected to its full physiological effects; and Prof. Osler suggests a course of hydrotherapy, massage, and electrical treatment. Nitroglycerin and nitrites, given until flushing and headache are produced, are also recommended. Calcium salts should be tried, but in this treatment the coagulation time of the blood should be studied. In the severe colic due to implication of the intestine morphine is necessary. In the presence of urgent symptoms from closing of the glottis scarification, intubation and even tracheotomy may be necessary. In cases with recurrence in the larynx Prof. Osler advises that an intubation apparatus should be kept at hand and some one taught its use.

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## URTICARIA PIGMENTOSA

SYNONYM.—*Xanthelasmoidea* (Tilbury Fox).

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**Definition.** — An uncommon affection, beginning usually in infancy, sometimes after puberty, and rarely congenital; characterised by the formation of macules or nodules, or a mixture of the two, with a special colouring varying from brown-yellow to brown-red, and in their active stages reddening and swelling in response to external or internal

stimulation; often associated with the phenomena of factitious urticaria on the apparently healthy skin, and with slight general adenitis; somewhat pruritic or not; the blood shewing in contrast to some cases of urticaria a shortened coagulation time and a large lime content; and histologically characterised by the presence of mast cells closely packed in columns in the rarefied dermis.

**History.**—Morrant Baker and Tilbury Fox first drew attention to this eruption in 1875, but a brief record of a case by Nettleship in 1869 was afterwards unearthed. Unna was the first to demonstrate the special histology. The name suggested by Sangster is still in use.

Fig. 50.—Urticaria pigmentosa.

**Pathology.**—The name urticaria was applied to this affection because the lesions have a marked tendency to "urticate" when excited by various external and internal irritants. Unna contended that the urticarial features are not essential and primary, but complicate a primary persistent trophic disturbance of the skin. Another writer has suggested that there is a general tendency, probably congenital, to over-production of mast cells. The lesions consist of "an almost purely cellular accumulation in a very fine, rarefied connective-tissue framework." The cells are frequently seen to surround blood-vessels, especially the sub-papillary and deeper plexus. Unna shewed that these cells are very large mast-cells, cuboidal from mutual pressure. "They lie closely packed and arranged into columns separated by the persisting collagenous tissue, between which, when spastic oedema is added, wide lymph spaces open." Unna says the oedema contrasts with that of urticaria proper in being limited to the

papillary body. Wandering cells are absent. Dr. Graham Little (7) found the apparently healthy skin between the lesions in one case to present mast cells and in another pigment. The peculiar colour is ascribed to the pigment in the basal prickle layer, and sometimes higher up, and also free in the corium close to the basal layer of epithelium ; also to the groups of mast cells. In old patches the mast cells disintegrate and haematin collects. Neisser suggested a connexion with naevi, and Darier says it is not a variety of urticaria, but a chronic dermatosis attached by its histology to retention tumours. Hallopeau lays special stress on the curious distribution of the eruption round the trunk, and on the formation of atrophic patches in a case (see his plate, St. Louis Museum *Atlas*). Drs. Graham Little and Paramore find the lime content at least not diminished, and the coagulation time of the blood shortened, perhaps because of the milk dietary. The salt content of the blood is increased, and there is a definite modification of the red blood-corpuscles tending to increase their resistance to destructive agents.

**Clinical Description.**—There is little to remark in the family antecedents, and it is not notably a family disease. The eruption has been noted to follow closely on vaccination, measles, chicken-pox, and fright, but probably this is only a coincidence. The patients do not present any particular departure from health, and generally are well grown and otherwise healthy.

*Age.*—The onset is said to occur in more than half the cases before the sixth month of life, and 70 per cent before the end of the first year (Little (7)). A number of cases have been observed to begin after puberty (thirteen years), and Darier recorded one at fifty-three years. The eruption is rarely congenital.

*Sex.*—In England and America it occurs twice as often in males as in females, but this incidence is less marked in Germany, and in France the sexes are about equally affected.

The *eruption* appears as characteristic lesions, or may be reddened and urticated, or, it is said, as bullae. In different cases they vary in size, and Dr. Graham Little describes them as guttate or nummular, and says that in a given case they may be fairly uniform, and do not increase in size. The same author found that in the cases he analysed, in 83 the eruption was entirely macular, 10 entirely nodular, that is, projecting more or less, and 28 had mixed lesions (7).

The colour which makes the eruption so characteristic varies "from brown-yellow through brown to deep brown-red." They become redder when irritated. In dependent parts, or those farthest away from the heart, an element of lividity is often seen in the lesions, and this is intensified by exposure to cold. On the trunk they assume a yellow or buff chamois-leather colour, mixed with other shades, such as *café au lait*, pale yellow, or olive, and simulating xanthoma. Sooner or later complete subsidence into pigmented macules takes place, and scars have been noted, possibly from traumatic causes.

It is one of the characteristics of this eruption that the elements

long retain the power of renewed turgescence, so that congestion, urtication, or even vesication, may be excited in them by mechanical irritation or heat, or by febrile or emotional excitement. In this way eruptions are repeatedly re-excited or kept constantly in a state of more or less turgescence. Factitious urticaria can also be excited in nearly all cases on the apparently normal skin; and it is very curious that such urticaria completely disappears without leaving pigmentation, at any rate as a rule. The consistence of the raised patches is sometimes velvety and soft, sometimes thickened. They may be raised 1-6 millimetres or more (see Tilbury Fox's remarkable nodular case, which he called *Xanthelasmoidea*, and portrayed in his *Atlas*), and have a granular or corrugated surface from stretching and subsequent subsidence. The macules, on the contrary, are smooth and polished.

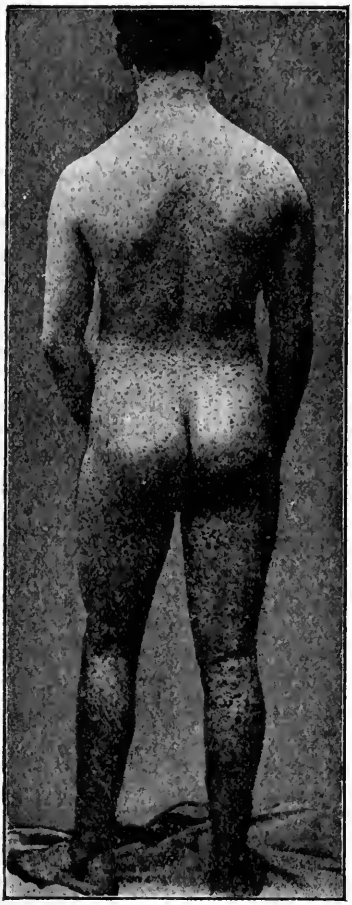

FIG. 51.—Urticaria pigmentosa of three years' duration in a boy aged eighteen years.

As with the colour and dimensions of the lesions, so the number and configuration vary. I have seen a case with less than a dozen macules, and Dr. Graham Little (7) has seen only one lesion supplemented later by a second. On the other hand, the eruption may be copious and confluent, so that the greater part of the surface is covered. The configuration is rounded or ovoid, sometimes varied in shape and irregular, but it may be elongated in conformity with the tension of the skin in various regions. So also, though distributed without apparent law, they tend to follow certain lines, as do other generalised eruptions; for example, along the transverse folds of the neck, parallel with the ribs, and down the arms. The rubbing of clothes also appears to have some influence in determining their site and number. Their first evolution may occur anywhere, but generally on the trunk; and the eruption may be confined to that part, or extend to the neck, extremities, scalp, genitals, and even to the face, and palms and soles, and the buccal mucous membrane and palate. In the latter site, however, histological proof has not been forthcoming. Itching is variable in intensity and far from constant. Turgescence of

the eruption, from any cause, increases the pruritus. Some degree of adenopathy has been noted.

According to Paul Raymond the eruption is continuous, but not progressive; for it becomes established in one or two outbursts, or most often after several spread over some weeks, or occurring in the course of 6-8-12 months. After it has become established the formed lesions persist, and peculiar febrile explosions, with excitement of the existing skin trouble,

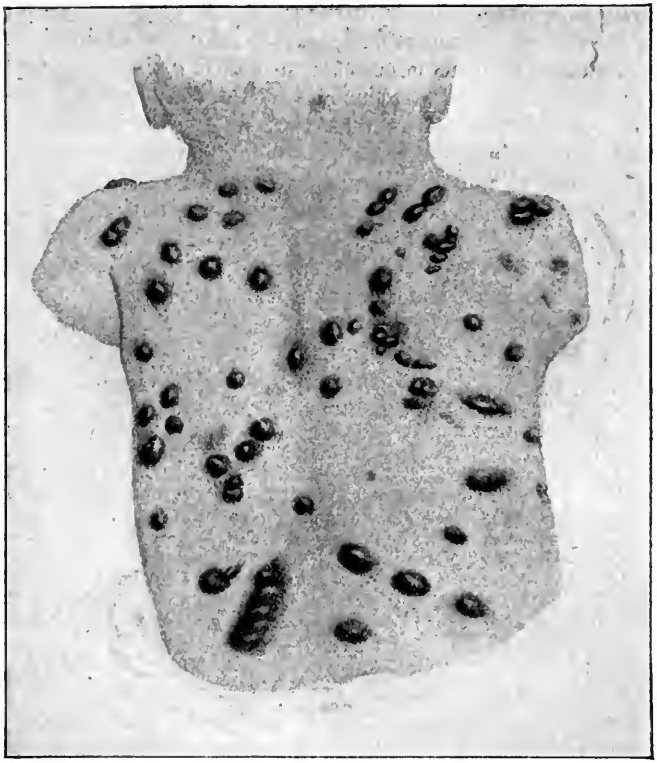

FIG. 52.—Urticaria pigmentosa nodularis. Xanthelasmoidea of Tilbury Fox. (Reproduced by the kindness of Dr. Graham Little.)

may occur with diminishing intensity. We do not observe the incessant change of site so characteristic of ordinary urticaria. There is a tendency for the malady to become quiescent, and no longer to be excited by stimuli, and little beyond pigment macules remain. Many lesions certainly disappear in some old-standing cases.

**Prognosis.**—The eruption is a chronic one and may last for years, and has been observed to persist into adult life; then, if not before, it tends to die out. The affection does not seem to interfere materially with growth and nutrition.

**Diagnosis.**—The eruption is so characteristic that there is usually no serious difficulty in making a correct diagnosis, or, if difficulty exists, a biopsy and microscopic examination will readily decide. In the turgescent state E. multiforme or urticaria may be suggested. The chamois-leather-like patches may simulate xanthoma, especially when the eyelids are affected, and in the rare giant forms. The only other error to be guarded against is confusion with pigment macules, primary, or left by other eruptions, as by syphilides, or, rarely, by a true urticaria. This danger is, of course, most likely to arise in the older cases. None of these states, however, possesses the property of turgescence under excitement.

**Treatment.**—It seems impossible to remove existing eruptions, but, as with L. urticatus, all excitements arising internally or externally should be guarded against as far as possible, especially in the period when the febrile outbursts threaten. Itching should be controlled by the remedies mentioned under urticaria (p. 224) and L. urticatus (p. 243). A word of warning may be given as regards stimulating baths, which in some cases have appeared to excite an outburst. Some writers have stated that some improvement has resulted from the administration of salicin and calcium salts, and the application of *x*-rays.

T. Colcott Fox.

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T. C. F.

## LICHEN URTICATUS (BATEMAN)

Synonyms.—*Lichen pruriginosus, L. strophulosus* (Rayer, Biett); *Lichen simplex aigu* (E. Vidal); *Strophulus pruriginosus* (Hardy); *Urticaria papulosa* (Kaposi, Duhring, Crocker); *Prurigo infantilis* (J. Hutchinson, Pye-Smith, Payne); *Prurigo temporanea autotoxica* (Tommasoli); *Prurigo simplex* (Brocq).

By T. Colcott Fox, M.B., F.R.C.P.

**Definition.**—An exceedingly common, non-contagious eruption; chiefly of infancy and of the summer months; characterised by the successive evolution of transient, rounded, erythematous macules, sometimes urti-

cate and rarely bullous, about the size of a split pea or the little finger-nail, centred by a more lasting inflammatory infiltration, which can be seen as a darker, or felt as a firm, miliary or prurigo-like papular projection, or more rarely as a vesicle or pustule; accompanied by great irritation.

**Etiology.**—As with the prurigo of Hebra, there is a difference of opinion whether the irritable eruption be primary, or whether a pruritus and tendency to certain nutritive disturbances be the essential features on which the eruption is engrafted by various external irritants. Sir J. Hutchinson for many years has strenuously advocated the latter opinion in this country, as have Vidal and others in France. Sir J. Hutchinson thinks that varicella, varioloid, vaccinia, and other exanthems possess the power in exceptional cases of making the skin "irritable," and leave behind them a special pruriginous tendency; but, he adds, whatever the initial cause, prurigo causes itching, and the latter scratching, and this again aggravates the prurigo. "If we could entirely prevent scratching very few prurigos would assume a severe type." It is certain that the eruption often follows closely on the acute specific fevers and vaccinia, and also occurs frequently in the subjects of hereditary syphilis and rickets, and possibly these affections simply dispose' to the ensuing debility, acting perhaps specially on the nervous system, or disturbing the digestive functions. Sir J. Hutchinson believes the papular form to be mainly excited by the bites of insect pests, more especially bugs and fleas (see etiology of Urticaria, p. 215); but against this view may be instanced the occurrence of the affection in circumstances in which the presence of these insects can be confidently excluded, and the experience of mothers to the contrary. Definite flea-bites side by side with the eruption may be observed, but the two lesions are usually perfectly distinct. That scratching makes the lesions urticarial is undoubted, but they arise also in regions inaccessible to the infant. Pye-Smith, who also regarded the pruritus as primary, suggested the irritation of sweat, and the incidence of the eruption and its increased severity in the hot months are very striking.

It has been said that because reflex action is the chief feature of the nervous system of the new-born infant, therefore its manifestations are the more pronounced as the highest restraining centres are as yet undeveloped. "The reflex sensory area is more extensive in the child, and the discharge of the centre upon excitation is at once more decided and widespread." Thus dentition troubles have always been held to be an important exciting agent. All authors agree that dyspepsia, from improper feeding or feeble digestion, and chronic intestinal catarrh are leading factors in the etiology. Funk and Grundrach support Comby's conclusion that dilatation of the stomach is frequently present. The mechanism by which the eruption follows from the gastro-intestinal disturbance is also debatable, whether by reflex action or by intoxication.

**Pathology.**—Kaposi says the eruption consists of papules infiltrated with serosity. For the rest, some authors describe the papules as a special form of small wheal (U. papulosa) for the most part peculiar to

infancy; others, on clinical or histological grounds (Tommasoli), as essentially prurigo papules. Darier says the histology is characteristic. The papule is dermo-epidermic, and constituted by papillary oedema with a diffuse infiltration of leucocytes and by vascular dilatations, by oedema of the rete, and the formation of a lenticular disc of colloid aspect, seated immediately under the corneous layer, and composed of parakeratotic corneous cells and oedematous and dried epidermic cells; underneath

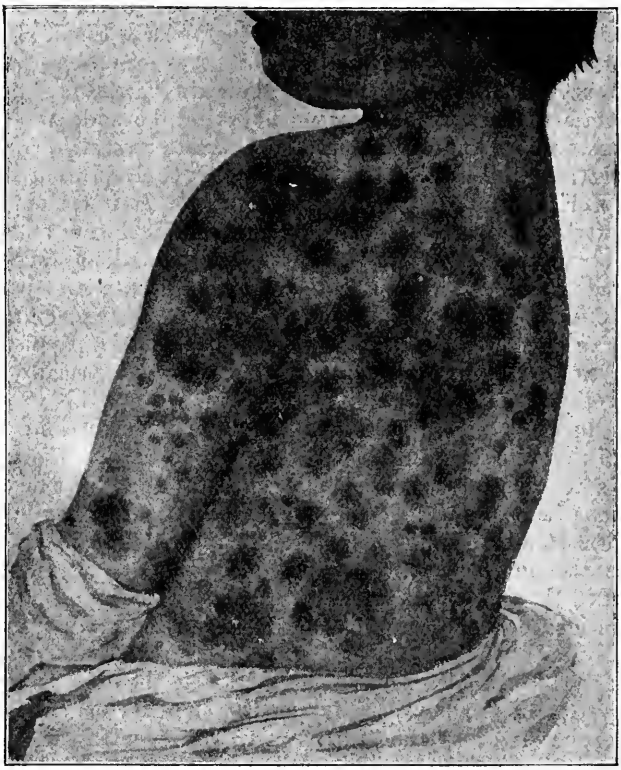

FIG. 53.—Lichen urticatus (Bateman). The figure shews the most frequent phase with prurigo-like papules forming the centre of congestive macules.

and upon the borders of the disc there is constantly spongiosis. Genuine urticaria, as seen in the adult, may occur, though rarely, in the infant, and conforms to the type. Hutchinson, Payne, and Brocq differ from McCall Anderson in thinking it impossible to range "L. urticatus" in the same group with true urticaria, and the French class it as a prurigo. The question has also been raised whether a minority of these cases take on the form of Hebra's prurigo, which is said to begin as an urticaria, and with which it has many affinities. My own conclusion is given on p. 242.

**Description.**—It is customary to include a few lines descriptive of this very frequent infantile eruption under urticaria; but its peculiar characters, connecting urticaria and prurigo, appear to warrant a separate description. Although it is evident that some of its phases were included by Willan and others under the name Strophulus, it is to Thomas Bateman that we owe its discrimination. As commonly met with, the erup-

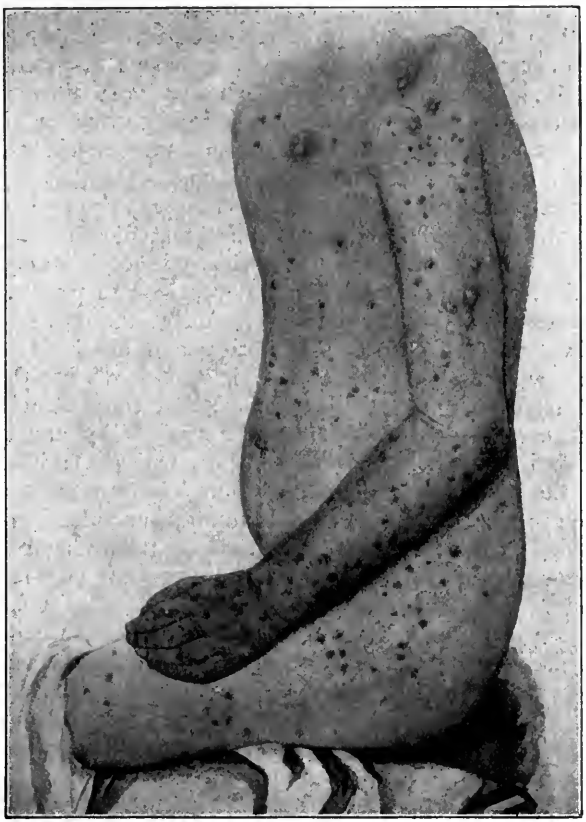

FIG. 54.—Lichen urticatus (Bateman). The varicelliform phase (varicella-prurigo of Sir J. Hutchinson) in which a more intense process forms vesicles instead of papules in the centre of the congested macules.

tion in slight cases consists in the daytime of circumscribed prurigo-like papules, disseminated scantily or copiously over the skin without apparent order, but sometimes clustered here and there, of a pale rosy hue, varying in size from a millet to a hemp seed, firm to the touch, and tending after some days to disappear spontaneously (lichen prurigo of Hutchinson). These papules are inclined to be obtusely conical at first, but flatten down; in the course of retrogression they become pale, polished, angular in outline, often disclose a central punctum, and then indeed simulate

very closely the papules of lichen planus. It is very unusual not to find a certain number of quite recent lesions, and these will be seen to consist of erythematous or more or less urticate macules centred by the papules, or, as French writers describe it, the papule forms in the centre of a more or less fugaceous urticarial plaque. Darier says the papule is always centred by a yellowish point which is a minute crust. The remains of these evanescent macules will also be detected around older papules. The mother will usually state that the child is covered, towards evening and in the night and, in severe cases, in the daytime, with congestive or urticarial blotches, or, as she expresses it, "smothered with blisters." It is obviously impossible, however, to prove that every papule is thus evolved. Some authors describe the pruritus as the essential underlying state and the eruptions as secondary; and most hold the papule to be the primary lesion, and state that erythema and wheals may be consecutive. This subject has given rise to much diversity of opinion and confusion. I have carefully studied this eruption for many years, and I am satisfied that the primary lesion is an erythematous, perhaps urticate, macule with the central prurigo-like papule. The irritation is excessive, and the child is constantly rubbing and scratching, and excoriating the papules. The restless and often sleepless nights gradually cause a marked deterioration in the child's health, and make a serious demand on the patience and health of those sleeping with the patient. A certain degree of vasomotor excitability and response to mechanical irritation often exists (factitious urticaria); indeed Barthélemy says the "petit état dermographique" is extremely frequent in infants, even in very young ones. I have not, as a rule, found this very well marked. It is notable, however, that the freshly evolved papule is often oedematous, and an urticarial response certainly may be excited by rubbing and scratching, as in the true prurigo papule. The heat of the fire, of bed, or of a warm bath, or an access of passion, will make the lesions red and tumescent. The hands and feet on every aspect may be invaded, as well as the face and scalp; but not the mucous membranes, so far as I have seen. The incidence is, however, chiefly on the trunk and limbs, but the larger flexures are apt to escape as in ichthyosis and Hebra's prurigo. The legs are specially affected.

In a minority of cases the process is so intense that the central papule is capped or replaced by a vesicle. All degrees of this are seen. Sometimes it is partial, and a varioloid-like lesion results. Sometimes it is perfect, and the eruption may exactly resemble varicella. This is Hutchinson's varicella-prurigo. It is also not uncommon to see the entire elementary lesion evolve as perfect small bullae or large vesicles on the hands and feet, as in scabies. Such a vesicular eruption can be seen preceding or following the usual papular phase, or mixed with it.

In rare cases the contents of the vesicles rapidly become puriform, and a pustular eruption results, which I have seen mistaken for variola (see New Sydenham Soc. Atlas. pl. xxxii., entitled "Pruriginous impetigo following varicella").

To this picture must be added the secondary results of scratching; namely, the excoriation and crusting of the lesions, and the occasional auto-inoculation of pus setting up impetigo and ecthyma. Brocq points out that the "lichenification" and "eczematisation" so rapidly produced in Hebra's prurigo are here absent, as a rule. Nor are the glandular enlargements conspicuous.

An infant may have a few lesions from time to time, or only a passing outbreak; but too frequently the affection is chronic and refractory. Thus it may die down in a cold season, be active again in warm weather, and so continue from earliest infancy to five, six, seven, eight, nine years of age, and perhaps later. In the cases I have watched for some years the eruption has always kept to the same type, and never become the prurigo of Hebra. It is frequently seen soon after birth, and generally begins in infancy; but Dubreuilh has seen it in a boy of fifteen years, and in a woman over thirty in whom rubbing excited a lenticular elevation centred by a firmer point.

**Diagnosis.**—*Hebra's prurigo* is distinguished by its site; it remarkably avoids the great flexures, palms, and soles, and, to a less extent, the face; and is most pronounced on the lower extremities. The hemp-seed sized papules, in my judgment, though analogous, are for the most part distinguishable in aspect and size; but they can urticate and be mixed with some wheals. There are no erythematous macules centred by a papule. Brocq insists on the tendency to "eczematisation" and "lichenisation" which is absent in L. urticatus. Nor are enlarged glands common in lichen urticatus. I agree with Sir J. Hutchinson, who says we have no reason to believe that any considerable proportion of cases of lichen urticatus are prolonged into adult life.

*Scabies* is often most closely simulated in all its phases, even to the vesicles on the fingers and toes, and the nocturnal irritation; but cunicula are absent from the sides of the feet and hands, and, though the case may be chronic, no one else in the family, except maybe another child, will be affected. Frequently also the characteristic macules will at once suggest lichen urticatus.

Reference has already been made to the close simulation of *L. planus* by retrograde papules. Several cases of extraordinarily copious "L. planus infantum" were shewn at the Dermatological Society of London, where not a wheal or erythematous macule was visible, but which subsequently proved to be "L. urticatus." The same may be said of sweat rashes.

Lastly, let the reader remember the simulation of *varicella* in some cases, which may momentarily deceive him.

**Treatment.**—It will almost suffice to refer to the etiology discussed, and then to the treatment laid down for urticaria, allowing for the affection being infantile.

It is advisable to regulate the hygiene of the child with respect to the clothing, the heating and ventilation of rooms, and over-heating in bed. The possibility of insect attacks should be inquired into, and their

ravages prevented by the use of insecticide powders, or other means. Easy dentition must be favoured, and scratching prevented as much as possible. All debilitating influences, such as hereditary syphilis, rickets, and the effects of the acute specific fevers, must be met by appropriate treatment. Lastly, attention must be concentrated on the strict regulation of the diet as to quantity and quality, and on the endeavour to promote perfect digestion of food and proper evacuation of the bowels. The most careful investigation must be made for any clue of fermentation and decomposition of food in the gastro-intestinal tract, and to catarrh or dilatation of the stomach. Yet when all this is done, or little is found wrong, our efforts to control the eruption may be unavailing. The intractability of many cases is evidenced by the fact that almost every drug in the Pharmacopoeia has been recommended by one physician or another. Belladonna I have not found of very great service. It is absolutely essential in some cases to administer a hypnotic at night, both for the sake of the child and others; and I have found opium carefully administered of service, and chloral very useful. Antipyrin is also highly recommended.

Locally, the lotions recommended for urticaria, such as vinegar lotions or camphorated aromatic vinegar, or carbolic or ichthyol (1.0 per cent) lotion, or Hutchinson's lotion (℞ Liq. plumbi subacetatis ℥ v., liq. carbonis detergentis ℥ x., to the ounce of water), are useful; followed by powdering. I also use ℞ Hydrarg. perchlor. gr. iss., chloroform ℥ xx., glycerin ʒij., rose water to ʒviij. Barendt recommends an ointment of 1 per cent carbolic acid, or 2 per cent naphthol, in benzoated lard. The recently introduced occlusive dressings mentioned under urticaria are very useful. Pustulation calls for cleansing and dilute ammoniated mercury ointment.

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T. C. F.

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## ERYTHEMAS

By T. Colcott Fox, M.B., F.R.C.P.

The name Erythema (ἐρύθημα, a blush) conveys the idea of redness of the skin, which is due to active congestion with blood, and disappears temporarily on pressure. It is distinct from the structural alteration of the

blood-vessels known as naevi and telangiectases, and from haemorrhage. It has, with much confusion, been applied indiscriminately to a host of conditions in which a congestive redness of the surface is the striking clinical feature. Early stages or mild degrees of inflammation characteristic of definite eruptions are often spoken of as "erythematous"—that is, erythema-like; for example, erythematous lupus, eczema, dermatitis, syphilodermia, leprosy, and so forth. At the present day the name is more strictly used to denote a group of reaction eruptions of the skin with a special etiology and predominant hyperaemic features, comprising actively congestive elementary lesions (erythema hyperaemicum rashes), and a more pronounced exudative type (erythema exudativum).

The name *erythrodermia* was coined by Besnier to denote extensive areas, or a generalised condition, of reddened skin (usually accompanied by some degree of infiltration), such as are met with as a stage of mycosis fungoides, or a generalised phase of psoriasis, eczema, pityriasis rubra pilaris, and so forth. It has been extended to denote almost any kind of red patch of uncertain nature, for example the érythrodermies pityriasiques en plaques disséminées (Brocq).

The term *exanthem* is applied by most authors to denote a cutaneous efflorescence, and not a malady. Indeed its application is often limited by authors to the rashes of the acute specific fevers. Bazin applied the term *pseudo-exanthems* to denote a group of erythemas simulating the erythematous pyrexias, but Besnier prefers, as more correct, the term *exanthematic pseudo-pyrexias*, or *pseudo-pyretic* or *pyretoid erythemas*. Heinrich Auspitz used the word in a much wider sense, and proposed to denote the whole picture of the objective skin symptoms, as seen in a patient, by the term *exanthem*. The elemental forms present he designated as *anthemas*, and the various secondary and later groupings, which go to make up the whole exanthem, as *synanthemas*. Under the term *erythanthema* he referred to "all those symptom-groups upon the skin which are characterised by the combination of various primary forms, such as nodules, vesicles, pustules, wheals, which occur with a variable arrangement upon a reddened (inflammatory) base."

**Hyperaemia** is divided into two classes, active congestive hyperaemia and stagnatory hyperaemia. By active *congestive hyperaemia* we denote an excess of blood in the vessels, with diminished resistance and increased rapidity of the blood-stream, producing increased warmth and redness temporarily effaceable by pressure, sometimes a degree of swelling, and some disorder of sensation, such as heat and itching. Unna contends, though not very convincingly, that the term "active" usually applied to this state is inappropriate, since the vessels are paralysed; so also the term "arterial," because the veins are equally affected with the arteries. "The more intensely developed the redness," he says, "the darker and bluer it appears; not, as has been suggested, because every 'arterial' hyperaemia passes into a more 'venous' one, but because in more marked congestion the deeper-lying veins and arteries of the skin are more filled, and then appear bluish through the higher red of the superficial vessels."

"Our comprehension of simple congestion, as opposed to inflammation, lies in the absence of every secondary tissue-change"; and Unna affirms that in pure erythema, even though long-standing, there is no oedema and no pigmentation; though these may occur in stagnatory congestion. But other observers hold that simple congestion, unless very transient, may be followed by passing pigmentation and even slight desquamation; or may be associated with transudation of blood plasma and colouring matter and even leucocytes; and that only the issue of coagulable serosity and the active proliferation of connective-tissue cells proclaim inflammation. We appreciate, therefore, at once the great difficulty of delimiting simple congestion clinically; and this the more as it often passes insensibly into inflammation and other nutritive perversions, such as desquamation.

The active congestions are of various importance; they assume diverse patterns; and they differ in their course (fugacious, acute, cyclical, persistent, chronic). The smallest vessels of the papillary layer, or of the upper corium, or of the periphery of the follicular ducts, are usually implicated; and the patterns of eruption stand in relation to these groups of vessels, and to what Unna calls the "vascular cones" and their surrounding "collateral nets." Thus the eruption may be punctiform or finely papular, or from a lentil to the finger nail in size, or larger still and in diffuse patches; it may be uniform, or figured or marbled; in contour regular or irregular.

These active congestive hyperaemias or erythemas may be localised, or more or less generalised; and they have been divided into (I) those due to local irritation (so-called idiopathic), and (II) those due to internal causes (symptomatic).

I. Those in the first group are readily transformed into, or may be the slightest grade or earliest stage of inflammation, and it is questionable whether they should not rather find a place under Dermatitis. Thus, an active hyperaemia is induced by the influence of chemical rays of the sun, the electric light, Röntgen rays, a current of hot or cold air, or very hot or cold baths. The old title *Erythema ab igne* was applied to the well-known congestion resulting in blotches, rings, or marblings of pigment on the shins and other regions of persons long exposed to the heat of fires. In France the term *Érythème pellagreux* is applied to a condition excited by the sun, chiefly on the backs of the hands of certain cachectic individuals with a special susceptibility, and notably in the pellagrous. The *chilblain* is often named *erythema pernio* (πτέρνα, the heel). *Erythema venenatum* is determined by a host of chemical substances, such as mustard; or by irritating discharges, for instance in babies. *E. traumaticum* arises from the pressure of garments, or by scratching and rubbing, and is probably due to a local reflex. *E. intertrigo* or *Intertrigo* (*inter*, between, and *tero*, I chafe) is very rarely a simple erythema. Two old-fashioned terms may also be referred to here, namely, *E. paratrimma* (παρατρίβω, I rub against) and *E. leve*; the former relates to the erythematous condition arising from the pressure or friction of ill-fitting

clothing, bedding, the saddle, and the like, and so to the condition preceding a bedsore; the latter signifies the redness seen on the surface of smooth dropsical skin. The name *E. gangrenosum* has been applied to patches of eruption often becoming gangrenous, which some authors ascribe to the use of artificial irritants, but which others consider neurotic. *E. keratodes* is a rare form of congestion of the palms with secondary keratosis. Lastly, we may mention the well-known "tache cérébrale" of certain febrile conditions, which is so closely allied to "dermographism" (p. 216).

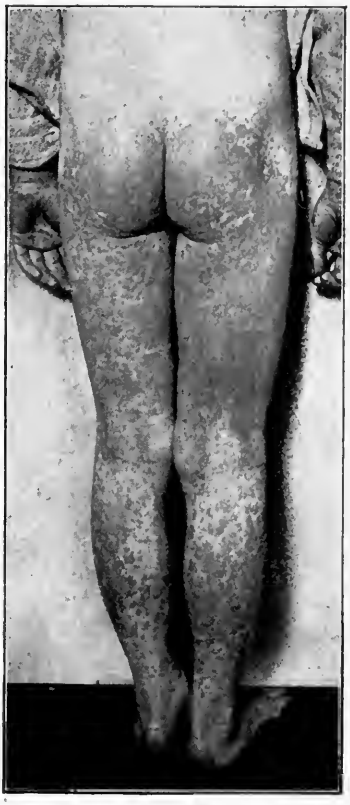

FIG. 55.—Generalised maculo-papular erythema.

II. The actively congestive erythemas due to internal causes are many, and of most diverse nature. The part played by the vasomotor system in their production was generally accepted at one time.

(*a*) First comes the psychical blushing, induced by emotions, such as joy, shame, or anger, and in this group we may mention the so-called *erythema pudendum*, consisting of roughly circular macules of rather irregular size appearing chiefly between the clavicles and fourth ribs, and to some extent on the shoulders, due to emotion in young women exposed for medical examination. (*b*) Apyretic reflex flushings associated with the climacterium and menstruation are well known; and in infants irregular patches are met with arising from troubles of dentition or various kinds of gastro-intestinal irritation. In the adult certain areas of the face ("flush-patches") are specially the seats of the reflex flushing brought about by disorder of the gastro-intestinal tract or the female genital apparatus (see *Rosacea*). J. F. Payne called attention to curious cases of *persistent flushing*. Here may be mentioned the hyperaemia immediately preceding certain forms of hyperidrosis. (*c*) Local congestive erythema may also occur with attacks of neuralgia; and in this connexion the *erythromelalgia* or red neuralgia of Weir Mitchell may be mentioned (*vide* Vol. VII. 149). (*d*) There is a heterogeneous collection of congestive erythemas, local or more generalised, associated with febrile states: for example, the hyperaemia following a rigor, the irregular areas of flush met with in the course of fevers (E. fugax), and the flush of the cheeks in pneumonia and pulmonary tuberculosis.

**Erythema Hyperaemicum.**—A superficial, fine-patterned, generalised Erythema.—We now come to a vast array of more or less generalised "rashes," which are commonly included in the congestive erythemas, but are quite distinct from the conditions hitherto mentioned, and form links in the chain with the phases to be described of exudative erythema, by reason of the similarity of causation and pathogeny. Hebra divorced them from their natural allies, the exudative erythemas. They are of great interest by reason of their frequency, pathogeny, etiology, and the diagnostic difficulties in their distinction from the eruptions of the acute specific fevers. They tend to be more or less generalised, and to assume an infinity of patterns with delicate distinctions; but they may be roughly grouped as *scarlatiniform*, *morbilliform*, and *macular*, and the latter often tends to extend eccentrically and form circinate and by junction gyrate figurations. On occasion these eruptions may be more or less haemorrhagic. The name *Roseola* is applied by different authors to various forms, but I reserve it for the macular form as in syphilis. Like the exudative erythemas, they are symptomatic of all sorts of toxic and infective conditions of the blood (blood-poisoning), and of all degrees of benignity and gravity, and may be associated with urticaria and purpura. In many cases the cause escapes us. It is generally accompanied by some passing febrile and constitutional disturbance, and perhaps injection of some synovial membranes (rheumatic), or visceral disturbance, according to the virulence of the agent.

*Etiology.*—A convenient classification of the origin of these non-contagious eruptions is the following: (1) Rashes prodromal or secondary in the acute specific fevers. (2) Macular eruptions, often ringed in true rheumatism. (3) Rashes incidental to the various septicaemic, pyaemic, and sapraemic states, including puerperal infection, infective endocarditis, and the so-called "surgical scarlet fever" so common before the introduction of antiseptic surgery. Bacterial toxins, according to Darier, with the exception of pyocyanin and mallein, are all vaso-dilators. (4) Rashes from the absorption of toxins in local processes, such as anginas, aphthous stomatitis, diphtheria, and from impetigo contagiosa, of which I have seen two cases. (5) Rashes from the subcutaneous injection of serums. (6) Rashes from the absorption of toxins following vaccination. (7) Rashes following the ingestion of food either acting on a person with a marked idiosyncrasy against the particular food, or containing toxic substances, as milk from diseased udders. (8) Rashes excited by the introduction of drugs into the economy through any channel. In this case also there is often an idiosyncrasy. (9) Rashes in visceral diseases, especially in the late stage of kidney disease. It has been described by Galliard in acute muco-membranous colitis in a child. (10) Rashes from the absorption of morbid products following the use of enemas. In this connexion the eruption may follow operations for appendicitis. (11) Auto-intoxication from the gastro-intestinal tract is often suggested when other causes are absent. (12) Rashes may occur in such conditions as trypanosomiasis, beriberi, dourine, dengue, and a

ringed, erythema-like eruption may occur late in syphilitic infections (neuro-syphilides of Unna). Certain of the causes mentioned, as tainted foods, may affect many persons and simulate an epidemic of some contagious disease.

Under the term *Recurrent exfoliative scarlatiniform Erythema* a special form of eruption has been described by many authors, which is presumably due to auto-intoxication. Usually ushered in by varying

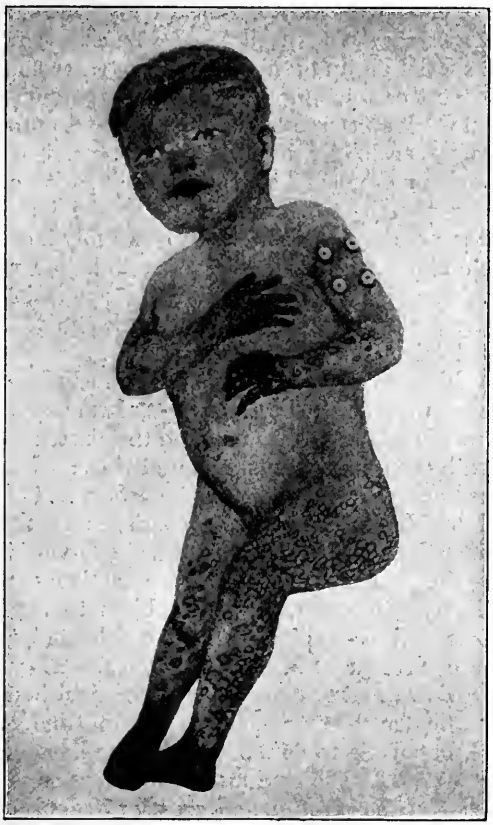

FIG. 56.—Vaccinal roseola, on the eighth day after vaccination.

degrees of febrile disturbance, a scarlatiniform eruption may begin at any part with rapid generalisation, and perhaps involvement of the conjunctiva, mouth, and throat. Free desquamation sets in before the eruption has undergone involution. Recurrences are the rule at irregular intervals, and may go on for years (*vide* p. 331). In this matter we must bear in mind the possible repetition of rashes from the use of certain drugs and foods, and that recurrences of some infective fevers, as measles, have been recorded.

*Diagnosis* may be exceedingly difficult, especially in the scarlatiniform

rashes in which the throat and mouth are involved, and febrile or other constitutional disturbance occurs. The macular eruptions have to be distinguished from the macular or roseolar syphilide with its special colouring and distribution, and from the scaling pityriasis rosea.

*Prognosis.*—The rashes themselves are of little consequence, but the cause is obviously the important factor.

*Treatment* of the eruption simply calls for local soothing lotions.

**Erythema Exudativum Multiforme** (Hebra)—SYN.: *E. multiforme* (Kaposi); *Eryanthema essentiale* (Auspitz).—*Definition.*—The name E. multiforme denotes a special group of non-contagious erythematous eruptions, probably for the most part symptomatic of some blood-poisoning, generally running an acute or subacute course like an exanthem, sometimes recurring at shorter or longer intervals, rarely persistent; distributed bilaterally and even more or less symmetrically, with certain favourite sites, and characterised by the formation of special red papules with a marked tendency to eccentric extension with possibly more or less perfect circination which may be concentric, or of nodules or nodosities of an exudative "erythematous" type, more rarely by vesicles and bullae, and are frequently multiform both as regards the stages of the process and the occasional coincidence of different phases.

*History.*—In his genus erythema, Willan included certain species described as E. marginatum, papulatum, tuberculatum, and nodosum; and whilst his work was in the press he announced the existence of a new genus, Iris, characterised by concentric multi-coloured rings. Willan's genus erythema was pruned and consolidated, and the group, as it stands now, was thus constituted by Hebra, because his experience taught him that the various species included were but phases of a single morbid process.

*Symptoms.*—The eruptive elements are actively congestive, and primarily of a lively red colour, but are subject to many modifications in this respect, as will be explained. They pale on pressure, and the more massive are firm or elastic to the touch. They are scanty, or numerous and crowded, and are generally disposed without order, though there is a marked tendency to symmetry. The outline of the lesions is essentially round, but liable to be modified by the lines of tension in the skin in different regions. The skin may be involved superficially, or even to the hypoderm; and the eruption may consist of papules (E. papulatum), nodules (E. nodulatum or tuberculatum), or nodosities or nodes (E. nodosum) as large, perhaps, as a split walnut.

Out of these fundamental forms numerous varieties may be evolved. In the more superficial kinds there is a marked tendency to a limited centrifugal expansion, and to the formation of rings, as in ringworm of glabrous parts (E. annulare, marginatum). The extending circles may be imperfect, or by intersection serpentine lines and various figured patterns may be produced (E. gyratum et figuratum). A rare but striking development of the ring-formation is the production of multi-coloured concentric circles (*en cocarde*), which suggested the name *Iris* to Willan. By confluence large diffuse plaques may be formed.

Another phase is brought about by the intensity of the inflammation. Exceptionally vesications are produced (E. vesiculosum, E. bullosum,

FIG. 57.—Erythema multiforme. Circinate papules on the face and neck. (Tilbury Fox, *Trans. Clin. Soc.*, Lond., 1878, xi. 85.)

E. iris), the contents of which may become sanguineous or puriform, and thus crusting and even scarring result. Very commonly the effusion of serum is insufficient, or not active enough, to cause vesication, but produces an

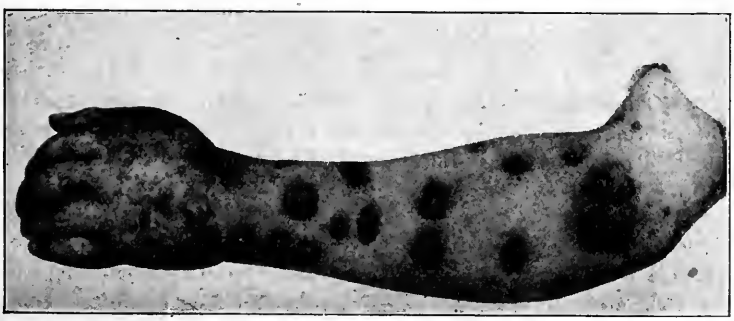

FIG. 58.—Erythema multiforme. Nodosities, formerly called tubercles, on the arm. (Tilbury Fox, *Trans. Clin. Soc.*, Lond., 1878, xi. 85.)

opalescence or a papule, simulating urticaria (E. urticatum), or of parts of a lesion causing variegation of colour and aspect. On the other hand, the vesication may be so intense and complete as to rise from the skin

like a pemphigus bulla or phlyctena (E. bullosum). The more intense zones of the concentric ringed lesions (E. iris) are especially prone to vesication. A marked tendency to the production of a diffuse angio-neurotic oedema exists, with consequent swelling of the part attacked; also for the transudation of red blood-corpuscles and the colouring matter of the blood; so that lesions, instead of appearing simply hyperaemic and oedematous, as they commonly do, may be blood-stained or actually haemorrhagic (E. haemorrhagicum). Hence the eruptive elements, especially the more massive ones, tend to pass through bruise-like changes of tint, and to leave temporary pigmentation. Rarely cases are met with in which the erythematous inflammation is entirely masked by haemorrhage,

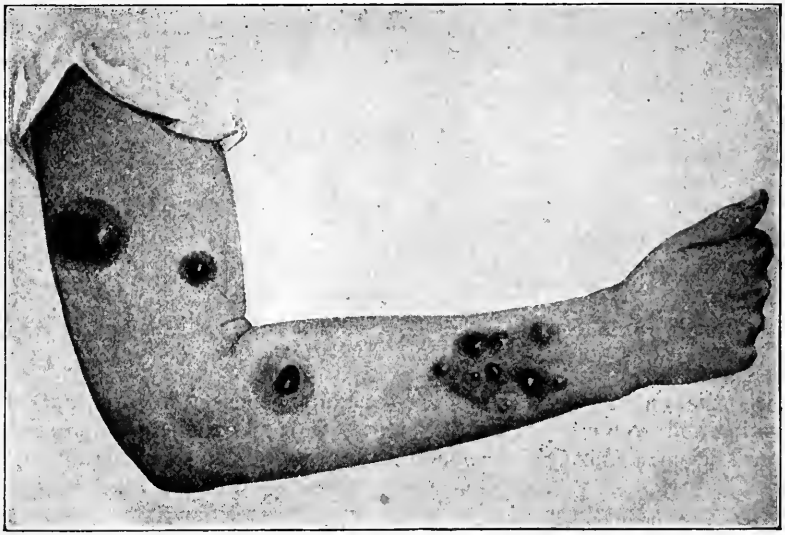

Fig. 59.—Bullous Erythema.

or the latter occurs independently, and seems to supplant the natural eruption, as in haemorrhagic small-pox. Deep-seated copious haemorrhage may lead to sloughing of the parts. The fundamental red colour of the eruption is thus apt to be modified in several directions; by the presence of fluid, insufficient to produce vesication, but enough to cause various opalescent and iridescent shades (E. urticatum and E. iris), and by the presence of blood, or its colouring matter, producing various tints of purple with ulterior changes. The hands and feet are often cold, and the eruption then assumes a cyanotic tint resembling chilblains. Desquamation is not marked, except as a sequel to vesication and its consequences.

Now, although the protean symptomatic picture is rightly insisted upon, it must be explained that this multiformity refers more particularly to the picture of the affection as a whole, and is chiefly brought about by

the wide range observable in a long series of cases in the area, bulk, form, colour, grouping, and aggregation of the primary lesions, and by the varying intensity of the inflammatory process. It is hardly an exaggeration to say that, in contrast with psoriasis, for instance, no two cases are alike. Different degrees of multiformity are also seen in particular cases, due to the changing aspect of the lesions during their life-history; to their evolution one after another, or in successive crops; and, as not infrequently happens, to the coexistence of different forms. It must, however, be clearly understood that the lesions, in any case, may conform to the original type throughout, or each may tend to go through similar changes, so that a fairly uniform eruption is not uncommonly met with (E. maculatum, papulatum, urticatum, nodosum, iris).

The duration of individual elements, and of the eruption as a whole, will vary as the depth to which the skin is involved, the intensity of the inflammation, and the quantity of the eruption. Individually, and as a whole, the eruption usually pursues an acute or subacute course, and may last only a few days, or a few weeks. In two to six weeks, as a rule, the process is completely ended. The subjective symptoms are usually unimportant, and consist of slight burning and itching. In some forms, such as E. iris, there is a decided tendency to frequent recurrence, and it is notable that in successive attacks the same form is apt to be preserved. Rare cases of chronicity have been recorded.

The distribution is to be noted. Being bilateral, with a strong disposition to symmetry, the eruption affects the hands and forearms, the face, neck, and behind the ears; also the feet and the knees; in other cases the extremities more extensively, and the trunk. Or it may be generalised. Nodes select the shins especially. The mucous membranes of the eye, mouth, and nose may be invaded, particularly in the phases known as E. iris; and in rare cases the mouth lesions may quite overshadow those of the skin. Herpes facialis or progenitalis, as in other febrile states, may be present.

When the causes are discussed it will appear that E. multiforme may occur in a number of pathological conditions, benign or grave, and therefore the *constitutional symptoms* will vary widely. Yet even when complicating some infective process (so-called secondary cases) the evolution of the eruption is generally associated with special symptoms, as in the so-called primary cases. As a rule the constitutional symptoms are slight, and may pass undetected. There may be some antecedent malaise for a few days or weeks, or the eruption may surprise a patient apparently in good health. The morbid process may be apyretic, or may be associated with all the variable phenomena of febrile reaction; of such are general malaise, quickened pulse, shiverings, aches and pains, especially in the joints; tonsillar, pharyngeal, or bronchial congestion; gastro-intestinal disturbance; transient albuminuria, and so forth. The fever, which may be high, may decline, continue, or even increase with the appearance of the eruption; or it may be confined to the eruptive period, and be ephemeral, remittent, subintrant, continuous, typhoidal, according to

circumstances (Besnier). In exceptional cases endocarditis, pericarditis, pleurisy, meningitis, pneumonia, or arthritis may supervene; but it will be readily understood that it is often difficult to distinguish the constitutional symptoms immediately associated with the outburst of the eruption from those of the malady it may complicate. Kaposi has observed haematuria with each recurrence. The analogies of E. multiforme with the eruptive fevers are often striking in many respects.

*E. nodosum.*—Some observers would separate E. nodosum as an independent symptom-group, because the nodose form of eruption is peculiar,—not, like all other phases, evolved out of the maculo-papule,—and because of its peculiar localisation over the shins. Others regard it as a simple variety of E. multiforme, since smaller nodules are frequently present on the arms; and rare instances have been recorded in which other phases of E. multiforme have been present. Moreover, the conditions under which it arises, its course, and the general symptoms attending it, do not differ materially from other phases of E. multiforme. The pathognomonic eruption is constituted by the bilateral manifestation of round, or oval, tender nodosities or nodes on the shins, from a pea to a split walnut in size, projecting more or less from the hypoderm, and, as a rule, very evident; at first of a bright, intense red, afterwards deepening in colour, and becoming violaceous; arranged with their long axis parallel to that of the limb, and often set in oedematous tissue. As they disappear the lesions take on various ecchymotic shades, as in a contusion. Patches may be formed by confluence. The number of nodosities present varies from a few to a couple of dozen or so. They are sometimes found—beyond their special site of predilection on the shins—on the thighs and arms, more rarely on the face and trunk, and, it is said, even on the mucous membranes. Recurrences are uncommon, but one or even two may occur (T. Barlow, S. Mackenzie, Lendon, Gorlitz). It disappears spontaneously in three to four weeks.

**Erythema Iris.**—This eruption was placed in a special genus called *Iris* by Willan, but further experience of vesicating phases caused its classification as *Herpes iris.* Rayer restored it to its proper place, but Bazin, unaware of Willan's observation, described it independently as *Hydroa vesiculosum*, and Besnier suggested the name *Erythema hydroa.*

This eruption has been often described in a special category on account of the remarkable picture it presents, the frequent implication of the mouth and nose, and its marked tendency to recurrence, which may happen once or twice a year or at longer intervals over many years, or occasionally be crowded. The elements appear as red macules or papules, and as they extend peripherally the inflammatory process undergoes alternate intensity and abatement, so that concentric circles of different colour and aspect and of a striking character are produced. In typical cases the central part may urticate or blister, then comes a ring of simple redness, again a ring of opaline swelling from oedema or vesicles, and so on several times. In abortive cases the elements may closely resemble E. papulatum; in intense reactions the whole lesion may form a bulla

(so-called pemphigus iris). The sites of predilection are the hands, especially on the dorsal aspects, the knees, insteps, and sometimes it is more extensively distributed. The neighbourhood of the mouth and the buccal mucous membrane are very frequently attacked by what looks like herpes simplex. The constitutional symptoms vary in severity, but sometimes the patient is distinctly ill. The cause is possibly a recurrent auto-intoxication.

**Etiology.**—Erythema multiforme, E. nodosum, and E. iris have been regarded as essential and specific diseases, or as simply reactions to various causes. The accumulating evidence points to the conclusion that the

Fig. 60.—Erythema Iris.

eruption, at any rate in many cases, is but an expression of various blood-poisonings; in this respect it is closely analogous to the generalised hyperaemic erythemas (roseolas), and some urticarias and purpuras. To make matters clear it is desirable to follow the evidence in some detail.

*Drugs.*—Almost every drug, whether administered by the mouth or rectum, by inunction or hypodermically, is capable on occasion, and in certain persons, of exciting various "rashes," mostly of a scarlatiniform, morbilliform, or macular type, which may urticate or vesicate. Such rashes are often correctly described as multiform in aspect, and also as exudative erythema. Hence it is said that E. multiforme (that is, in Hebra's sense) follows the ingestion of drugs. This important statement, however, must be accepted with caution, as the forms, as a rule, do not quite correspond; though, it must be confessed, the distinction is

difficult. Polotebnoff observed a case of generalised erythema papulatum following friction with tincture of iodine; and Kaposi says he has several times seen E. iris to follow a friction with Neapolitan ointment. The latter cases may possibly have an explanation other than toxaemia.

*Certain aliments* have been regarded as causes. And here we may point out that it is often a very nice question whether the macular, urticate, centrifugally enlarging, and figured eruptions so commonly seen after poisoning by tinned food and shellfish, should be considered as urticaria, or, as seems more fitting, erythema urticatum (p. 251).

*The serums*, much in use at the present day, can cause an eruption after the E. multiforme type in place of the commoner smaller-patterned rashes. Berg records such cases (*vide* art. "Serum Rashes," p. 113).

*Septicaemia and pyaemia*, again, in their many phases—medical, surgical, and puerperal—can unquestionably give rise to the eruption. Many cases could be mentioned, such as those of Demme and Finger. I have recorded a case of E. urticatum in the course of acute infective osteomyelitis; and Barth and Sir Thomas Oliver mention it as an accompaniment of infective endocarditis.

*Acute specific fevers* and other infective maladies are also to be mentioned, and many French theses deal with these facts. E. multiforme has been seen, though rarely, in the course of erysipelas (Pertat), small-pox (Kaposi), typhus and enteric fevers, glanders. I have seen it in diphtheria and vaccinia. Kaposi records the appearance of E. annulare on the backs of the hands with each recrudescence of a gonorrhoea (also Tenneson). Hutinel and also Parker and Hazen have seen E. iris in enteric fever. Hebra contends that the so-called roseola cholerica of the secondary fever is really an E. maculatum et papulatum. E. nodosum alone has been noted in enteric fever (de Langenhagen, Gillet, Thibierge), cholera (Lacome), diphtheria (Jouillié), infective angina (Legendre and Claisse), measles (Richardière), influenza (Comby), gonorrhoea (Fournier-Bès), malaria (Moncorvo, Wilhelm, Boicesco), septicaemia (Brodier). It has also been met with in the "rheumatism" complicating scarlet fever (Ashby and others), and in myelogenous leukaemia (Wallace Beatty). Uffelmann and Oehme, in 1876, attempted to trace a relation between E. nodosum and tuberculosis. Lailler saw it in pulmonary tuberculosis, Levy in acute tuberculosis; and Schamaun's thesis contains all the information on the subject as collected.

Should the circumstances thus reported be considered merely as accidental coincidences, or is the evidence sufficiently strong to warrant the conclusion that an intimate association exists between such infective diseases and E. multiforme? It may be remarked that in the cases in which this eruption occurs during the progress of such a disease as enteric fever, or during convalescence from it, we have to weigh the probability of the eruption being due either directly to the specific poison of the fever, or to some secondary infection, or to the influence of a drug.

*Rheumatism*, however, is the disease of all others which calls most

for discussion here. The association of both E. nodosum and the other phases of E. multiforme with rheumatism has been noted since the first quarter of the last century, and has never been without numerous distinguished upholders. Sir Stephen Mackenzie, who, in this country, was long a strenuous advocate of the association, pointed out that E. multiforme frequently occurs in the course of a malady characterised by the complete symptom-group recognised as rheumatic fever—such as fever; definite, fleeting, multiple arthritis (which may be recurrent); general pains, sour sweats, endocarditis, pericarditis, tonsillitis, pleurisy and pneumonia, and followed by anaemia; that in cases of E. multiforme a history of precedent or subsequent rheumatism may be obtained in greater proportion than, say, in lichen planus or lupus; that there is a preponderance of attack in the first three decennia of life, especially in the second and third, corresponding with the incidence of acute and subacute rheumatism. Cheadle, also, argued that before puberty, when the arthritis is a less prominent feature of rheumatism, the association or sequence of E. multiforme and various rheumatic phenomena, occurring singly or in various combinations, such as chorea, endocarditis, subcutaneous nodules, and torticollis, is so well marked as to be highly significant, and I think the rheumatic causation of erythema multiforme in children is indisputable. These authors represent numerous observers who go so far as to say that we are justified in regarding the majority of cases of E. multiforme as an expression of rheumatism, even in the absence of other definite symptoms of the latter affection. E. multiforme is said, like rheumatism, to occur most frequently in the spring and autumn, and to be prevalent at certain seasons; but this argument has not yet been placed on a secure basis. Sir S. Mackenzie found the eruptions most common in the first three decades, more particularly in the second and third, and to occur in four females to one male, and erythema nodosum in the proportion of five to one.

On the other hand, these various arguments are contested. It is pointed out that the symptom-group relied upon in the diagnosis of rheumatism is common to many infective states. Besnier has only very exceptionally seen a true acute articular rheumatism as part of the E. multiforme process.

The general opinion has long been tending in the direction that rheumatism is a general malady due to an infection of the organism by an agent of microbic nature; but until we possess some definite criterion by which to test this affection, and until its natural history is more perfectly known, the diversity of opinion as to the part played in causing E. multiforme will probably continue. Meanwhile it is significant that the great majority of observers see in E. multiforme the expression of a toxic or infective malady, primary or secondary. Various possible sources of the entry of the virus are pointed out, such as the tonsils, wounds of the mouth or genito-urinary organs, or skin. The modern views concerning "auto-intoxication" also afford a seductive explanation of some cases. The invasion, the mode of re-

action of the body, the prodromal period, the eruption and decline, the occurrence and nature of the visceral localisations, and the occasional gravity of the affection are all presumptions in its favour. Lastly, mention should be made of epidemics, such as that observed by Gall in Bosnia amongst soldiers; and of the occurrence of several cases in a family, or in a particular house or barrack, where emanations from drains have been discovered or suspected.

This account of the causes would not be complete without some mention of the *hypothesis of a nervous origin*. Cases have been attributed to mental shock, physical overwork, or such causes as incipient menstruation in neuropathics. Lewin called attention to its association with irritation of the genito-urinary tract, which he suggested brings about the eruption reflexly. This reflex hypothesis has been stretched to explain cases following tonsillitis or disturbances of other organs, including local irritation of the skin. Such agencies as exposure to cold, heat, or sudden alternations of temperature or exposure have also been evoked.

Many remote causes have been pointed out, such as anaemia, chlorosis, disordered menstruation, and debility from some infective disease, such as measles or diphtheria. Idiosyncrasy, as in drug eruptions, is probably a powerful element in determining the occurrence of the eruption. Whatever the cause may be, certainly in many cases, if not in the majority, it is not apparent.

**Morbid Anatomy.**—E. multiforme forms a well-defined group, histologically as well as clinically. To the simple appearances of inflammation, according to Unna, is added an angioneurotic spastic oedema, he therefore separates the group, on the one hand, from the pure angioneuroses—such as urticaria—on account of the textural changes; and, on the other hand, it is distinguished from other inflammations, both on account of the presence of the special spastic oedema, and of the limitation of the inflammation to the vessels and their immediate surroundings. The histological appearances consist in a dilatation of the vessels, cell proliferation around the vessel-walls, some emigration and oedema of the lymph spaces round the vessels and in the cutis, in different distribution. In E. nodosum, Unna says, "the whole vascular net of the cutis and papillary body is dilated and closely surrounded by densely packed cells," consisting of a slight emigration of leucocytes and distinct spindle-cell proliferations, contrasting with the paucity of cells in the cutis, which also arise from the spindle cells. These perivascular cells consist partly of leucocytes and partly of swollen spindle-cells in a state of mitotic division. There are no true plasma-cells. Leucocytes are often massed in the vessels. The elastic fibres of the cutis are well preserved, but in the perivascular sheath they disappear. Mast cells are in no great abundance. The coloration Unna attributes to the breaking-up of haemoglobin within the vessels. Evidence of the exudation of red corpuscles is often found, and in some cases dominates the picture. In the papular forms and its developments the papillary body is mainly involved. The

tissues here are much swollen, the elastic substance almost unrecognisable. Emigration of leucocytes is more marked than in E. nodosum, and with the oedema implicates the epidermis, which proliferates (acanthosis) in places where the leucocytes congregate. Vesicles form under the horny layer by displacement of cells. The fluid exudation is oedema in the more superficial and lighter lesions, but, according to Dubreuilh, more fibrinous in the intense and nodose forms; and red corpuscles wander out, and some proliferation of connective-tissue cells occurs, giving an inflammatory character to the lesions, which is less marked in the milder phases.

**Pathogeny.**—The angioneurotic view has been widely held for some years, and it is supposed that the circulating morbid agent acts on the central or peripheral vasomotor system, and so excites the eruption. This view, however, has been strenuously attacked in recent years, and the direct irritation of the vessels implicated. Various organisms have been detected in a certain proportion of cases, sometimes plugging the capillaries and suggesting that embolism may cause the eruption. Finger supports this origin in all cases arising in suppurative states.

**Prognosis.**—From what has been said it will appear that in the so-called secondary cases the prognosis has to do rather with the primary malady, such as cholera, enteric fever, rheumatism, and septicaemia. The problem really is to find out if the eruption is simply an incident complicating some other grave malady; for otherwise the affection runs a definite course, and usually ends favourably in from two to six weeks. Nevertheless patients are sometimes very ill, and in rare cases succumb. Recurrences may occur, though in E. nodosum they are rare. They are seen especially in "Herpes iris," which may relapse again and again for years.

**Diagnosis.**—From what has been said of the protean aspects assumed by this eruption, it is evident that much space might be occupied by the consideration of many conditions requiring careful discrimination. E. multiforme, however, conforms, in the majority of cases, to a perfectly characteristic clinical type. The features of the eruption, whether monomorphous or polymorphous, its essentially "erythematous" nature, its sudden onset and definite course, and its localisation are, as a rule, all characteristic. The features of E. multiforme once mastered, difficulty will only be experienced in aberrant cases, and chiefly in respect to morphology and locality. Certain rare exanthematic febrile outbursts of lupus erythematosus may occasion considerable difficulty for a time, especially when such an eruption invades the upper extremities as well as the face; or in more generalised outbursts, or when fleeting and so leaving no scars. Urtication sometimes renders the distinction from urticaria a delicate matter. Circination of macules, or papules, or more rarely of nodules, brings the eruption in its aspect, though not in its course, near to ringworms of glabrous parts (sometimes generalised), to some phases of pityriasis rosea, or to the more indolent or chronic eczema seborrhoeicum, macular leprosy, or macular and papular syphilides. Vesication of the macular or papular forms, or the circinate iris forms,

may cause the eruption to simulate closely an acute outburst of pemphigus, or dermatitis herpetiformis, or impetigo contagiosa (sometimes ringed), or a drug eruption. The vesico-pustular phase has been mistaken for variola.

The central umbilical crust is important for the diagnosis of E. hydroa in confluent and other conditions in which the form of the eruption is effaced or obscured (Besnier).

Erythema nodosum is usually perfectly characteristic in its appearance, localisation bilaterally on the shins, and definite course without suppuration or ulceration, but the nodules may be closely mimicked by the generalised febrile outbursts of nodular leprosy, by multiple precocious syphilitic phlebitis, by the early stages of some bromide and iodide eruptions, and by some rare forms of nodose urticaria or angioneurotic oedema. Tuberculous nodosities, whether disseminated or occurring in a chain up the lymphatics, or the phlegmons of glanders, septicaemia, and phlebitis, can hardly be mistaken. Moreover, the nodules of Bazin's erythema induratum, which are apt to occur on the legs of young women, are indolent and particularly affect the legs below the belly of the gastrocnemius, have a certain tendency to suppuration, and are not very tender. Intensely haemorrhagic forms are distinguished with great difficulty from some other haemorrhagic eruptions and purpura, and there is a closely allied phase of disease known as peliosis or purpura rheumatica (*vide* Vol. V. p. 856). Occasionally the eruption of E. multiforme is much restricted, to the forehead or infraclavicular regions, or hands, for example, and then ringworm, syphilides, dysidrosis, herpes, mosquito bites, chilblains, etc., may be simulated. In rare cases the mouth may be attacked alone, as in pemphigus, and diphtheroid lesions form; or lesions elsewhere may be very few, and the unwary are thus entrapped. Outbursts, renewed repeatedly before a prior attack has cleared away, or at short intervals, may simulate a more chronic process, such as pemphigus or dermatitis herpetiformis.

**Treatment.**—The rational treatment of E. multiforme depends on the discovery of the cause of each case, when we may deal wisely with the particular attack, and ward off a recurrence. The attempt must be made to determine whether the eruption in any given case is an expression of poisoning by a drug or a food, or is an "auto-intoxication," especially from the gastro-intestinal tract, or an infective process, especially rheumatism; or whether it be due to external seasonal influences; or to any impression on the nervous system by way of direct shock, or reflexly from some genito-urinary or other such trouble. The appropriate methods must then be adopted to hasten the elimination of the poison by way of the bowels or kidneys; or to counteract it by the suitable antidote, and to prevent visceral complications; or to guard against renewed action of the cause. Rest in bed is nearly always desirable, and the possibilities of visceral complications must be kept in mind. Those who believe that rheumatism is the most frequent cause rely for the most part on such drugs as salicylate of sodium, salicin, salol, salophen, and salipyrin during the actual attack; and will seek to build up the general

health, and take measures likely to ward off future attacks. As the eruption often pursues a definite short course without urgent or grave symptoms, and as the cause is frequently obscure, many practitioners content themselves by adopting a purely expectant treatment, or by promoting purgation and diuresis; for instance, by sulphate of magnesium and acetate of potassium, followed or accompanied by the administration of quinine. Certainly it is wise to ascertain and correct any such states as physical exhaustion, anaemia, or disordered menstruation. Secondary anaemia or debility must be removed by tonics, such as the iodide of iron, recommended by Wade. Boeck, in very acute cases, strongly recommends antifebrin. Villemin, and others since, have recorded excellent results from iodide of potassium in E. nodosum (30 grains in the twenty-four hours), but its efficacy is very doubtful. Locally the indications are to soothe the inflamed skin and to relieve uncomfortable disordered sensations such as itching, burning, or pain. Generally all that is required is the application of a powder, such as the zinc and starch powder, or the pulv. acidi borici subtilissimus, to which a more active antipruritic, such as camphor, may be added if necessary; or a lotion may be dabbed on frequently, such as lotio zinci oxidi, or the subacetate of lead lotion (5 minims to the ounce), the lotio hamamelidis, or an evaporating lotion. Weak resorcin or ichthyol lotions, or diluted lotio nigra, may also be used. Where much itching occurs, carbolic acid or an alcoholic solution of coal tar may be added. If crusts form they must be gently softened and cleansed away, and a soothing, bland ointment or varnish be applied. In the more painful nodes on the shins characteristic of E. nodosum hot fomentations are sometimes useful, in addition to painting with soothing applications.

T. Colcott Fox.

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## ERYTHEMA ELEVATUM DIUTINUM

By T. Colcott Fox, M.B., F.R.C.P.

In 1889 Dr. Judson Bury recorded, with a coloured portrait, "A case of erythema with remarkable nodular thickening and induration of skin, associated with intermittent albuminuria." A girl, in good general health, without personal history of chilblains or family history of gout or rheumatism, had post-scarlatinal "rheumatism" at nine years of age; and at twelve there appeared on the palms, flexor aspects of the wrists, some of the fingers, the backs of the elbows and knees, the toes, and left lumbar region, incompletely symmetrical purplish thickenings (not tender), with well-defined raised edges, which became nodular. The hands were warmer than normal, and the lesions itched and tingled at night. The apparent sequence was the patches of erythema exudativum

first, later the nodules. On the elbows bright reddish-purple papules appeared in the centre of fading erythematous patches, and enlarged into hard nodules. On the anterior aspect of the phalanges the induration was more diffuse, and more deeply seated. Small doses of arsenic did not appear to influence the condition. Sir J. Hutchinson (4) recapitulated this case, with additions, and reproduced the portrait. In a later note (5) he states that the case continued to be slowly aggressive, some patches increasing, others disappearing.

Under the title "Erythema elevatum diutinum" Radcliffe Crocker and Mr. Campbell Williams recorded, with a coloured portrait, a somewhat analogous case of erythematous, raised, persistent nodules in a girl six years old, with a good personal history, but a marked family history of rheumatism and gout. The eruption began five months

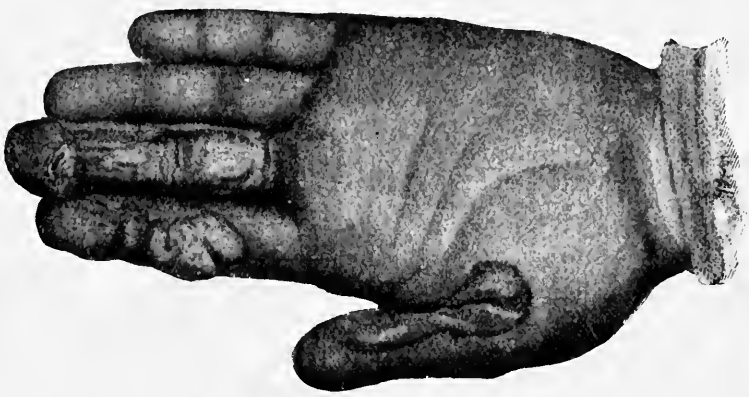

FIG. 61.—Erythema elevatum diutinum (with kind permission of Mr. Campbell Williams).

previously on both knees, and subsequently extended to the buttocks and elbows, and finally to the hands, on the thumbs and some of the fingers, with incomplete symmetry. The lesions were raised, convex, sharply defined, pale purplish-red with a few dilated vessels, mostly quite smooth, somewhat warm and very tender on pressure, firm to the touch, without itching or burning, and leaving on retrocession a temporary stain. Histologically the process was shewn to be a chronic inflammation lying between the epidermis and the deep portion of the corium adjacent to the coil glands. The place of the normal fibres of the corium was to a great extent taken by a fibro-cellular structure—in some places cells predominating, in others fibres. There was no thickening of the vessel-walls. The eruption disappeared in a year (whilst under treatment by arsenic) except for some thickening of the palmar fascia. Crocker called attention to the similarity of model 1599 of the hand of a child in the museum of the Hôpital St. Louis, deposited by Quinquaud, and entitled "*Fibromes multiples nodulaires des extrémités, histologiquement fibromes fasciculés.*"

Dr. F. J. Smith published a case remarkable, amongst other things, for the size of the lesions, and their persistence. Miss U., a well-grown and fully-developed but rather anaemic girl of eighteen or nineteen years, began to be troubled by rheumatic pains in the arms for a year before she was seen in November 1890, and coincidently, according to the patient's statement, pale spots appeared, which gradually thickened and enlarged. All the lumps were more or less circular or oval, firm, blue, and congested in colour and appearance, raised one-twelfth of an inch above the level of the surrounding skin, apparently situated in or just below the epidermis, and freely movable over tendons and fascia. In some places the thickening was diffused with specialised lumps. They were situated with imperfect symmetry on the olecranon on each side, thumb, several fingers of each hand, and left wrist. Two years later there was no change. Histologically the growths were pure fibromas with hardly any cells or nuclei. This case also has been recorded by Sir J. Hutchinson, who adds that the girl had suffered from quinsy, and that there was a strong family history of gout and tendency to torpid liver. The eruption began on the elbow, and attacked the knees and one heel. Halle has also described a case with this title.

I simply refer without comment to this interesting group of cases. It is possible they belong to the group *Granuloma annulare.*

T. Colcott Fox.

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## GRANULOMA ANNULARE

By T. Colcott Fox, M.B., F.R.C.P.

Of late years a number of cases have been recorded under various names, and are here referred to under that given by Radcliffe Crocker, but there is some difference of opinion as to the identity of all the cases. The elementary lesions are almost invariably nodules, rather less than the size of a boiled sago grain, felt as deep-seated pea-sized bodies in the skin, projecting about one-sixteenth of an inch, whitish and semi-translucent in aspect, especially if the skin is stretched, and later becoming reddened or bluish. A striking feature is the tendency for the nodules to form aggregations with a peripheral congested zone, sometimes likened to a pearl brooch, or to evolve spontaneously in

ringed or crescentic formation ($\frac{1}{2}$ to 2 inches or more in diameter), or to become so secondarily by involution of the centre of the aggregation, which is left discoloured and suggestive of atrophy. The lesions, however, do not leave any scarring behind when they disappear. Some observers think individual nodules may evolve into rings. The lesions form on the hands most commonly, especially on the back of the fingers and wrist, then on the feet, ankles, neck, elbows, knees, and buttocks. The face and scalp are rarely affected. The lesions may be few,

FIG. 62.—Granuloma annulare of woman's hand.

even single; exceptionally they are extensively distributed, but never approach generalisation. When untreated the eruption is indolent, and is apt to persist perhaps for years, but it may disappear spontaneously at any time. The incidence is about equal in the two sexes, and the condition has been noted between the ages of eighteen months to fifty-two years. Dr. Graham Little notes 19 cases under twelve years, and 28 above that age, and says there is a special tendency for the eruption to appear in summer.

*Histology.*—Dr. Graham Little (10), after a study of the type described by Dr. J. Galloway as *Lichen annulatus*, a name given from the clinical appearance simulating somewhat a circinate lichen planus, and a second well-characterised type, argues for the identity of the whole. An inflammation is disclosed massed in the deeper parts of the corium, and in some cases obviously surrounding the sweat coils, and spreading towards the surface to a diminished degree around the blood-vessels and along the hair- and sweat-follicles. The pathological cells are (1) large mononuclear cells, larger than leucocytes, staining vividly with nuclear dyes, shewing a thin periphery of protoplasm; (2) numerous spindle-cells, not staining so deeply, with elongated nuclei and indistinguish-

able from connective-tissue corpuscles; (3) a few large, faintly-stained, disseminated epitheloid cells; (4) mast cells, occasionally numerous. The central part of the masses may degenerate. A giant cell was found in one case. The vessels may be thickened and even obliterated.

*The nature* of the disease is obscure, but Dr. Graham Little attaches significance to the tuberculous antecedents frequently elicited.

*The diagnosis* is not easy for those unacquainted with the disease, but many cases are very characteristic for the expert. The observer should pass in review circinate lichen planus, porokeratosis, erythema elevatum diutinum, the special form of subcutaneous nodules connected with the fibrous structures occurring in rheumatic children, and the fibrous nodules described in adult subjects suffering from rheumatism, gout, and rheumatoid arthropathies. Phleboliths may simulate subcutaneous fibrous nodules (Rolleston). I have appended some references which may be of interest.

*The prognosis* is uniformly good, and ultimately the eruption disappears spontaneously.

*Treatment.*—According to Dr. Graham Little (10), local measures by resolvents, such as salicylic acid in ointment and plaster, ichthyol, and resorcin succeed. Jadassohn thought well of arsenic internally.

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# PRURIGO

By T. Colcott Fox, M.B., F.R.C.P.

**Introduction.**—A few introductory remarks may serve to make a somewhat confused subject clearer. Willan defined prurigo as an association of the symptom of itching, occurring as the leading event, with a special eruption and other peculiar appearances; and he included the group, with strophulus and what was then known as lichen, amongst the papular eruptions. He divided the prurigos into two categories—(1) those in which a large portion of the surface is involved, including a P. mitis, and a P. formicans (neither very clearly defined), and a P. senilis, which subsequent observation has shewn to be largely due to the presence of lice; and (2) the local prurigos, including that of the podex, prepuce, pubes (pediculosis), scrotum, urethra, and female pudenda. Erasmus Wilson held that "prurigo is a pruritus associated with an organic change in the tissues of the skin. It is a neurosis and liable to paroxysms, and is very much aggravated in character by the advance of age. Hence a distinction into prurigo mitis and prurigo senilis. Prurigo mitis may occur at any period of life, but the eruption which is present is due to secondary irritation of the skin caused by scratching, rather than to the force of the neurotic affection." He adds that prurigo senilis is accompanied by a papular eruption also. And again: "The pathognomonic characteristic of prurigo is, however, pruritus." "The student of dermatology would form a very inaccurate idea of prurigo if he were to seek for it solely in the presence of papules. A more practical picture of the disease is to be found in the itching or pruritus without obvious or apparent cause; the neurotic character of the itching; the altered appearance of the skin, arising from defective nutrition; its readiness to bleed when scratched; and last of all the papulation, which is as frequently the consequence of the scratching as its cause." Sir J. Hutchinson wrote: "Pruritus is the symptom common to all forms of 'prurigo,' and the latter term is applicable to any malady of which itching is the paramount symptom and cause of aggravation." From the localised P. podicis and pudendi he distinguished generalised prurigos such as varicella prurigo and lichen prurigo, which is referred to under lichen urticatus, and a summer prurigo, which is included under the term Hydroa aestivale. Hebra protested against the indiscriminate use of the terms pruritus and prurigo and the insufficient distinction between them. He reserved the term prurigo exclusively to a special lifelong and incurable form of disease (known as P. Hebrae), and now recognised by all dermatologists with some reserves, and his views predominated for some years. Objection, however, was raised to Hebra's exclusive view, and modern French observers particularly have reverted in some measure

to the older conception. In the first place, the itching is regarded as primary, and this is thought to be proved by the cessation of papule formation when the itching skin is protected from scratching by occlusive dressings. This view has not met with complete acceptance. In the next place, the consequences, nearly invariable, of itching are rubbing and scratching, and they limit the term pruritus to the states of itching in which the skin remains free from secondary reactions, and only some excoriations are formed, or some coccic infections. But in certain cases the itching skin reacts to the rubbing and scratching in special ways, namely, by the formation of special papules, by the patchy or diffuse thickened condition of the skin, known as lichenisation or lichenification (*vide* p. 295), or by what is called eczematisation. Some observers limited the term prurigo to the itching states in which a special papule appears, and Brocq includes Hebra's prurigo, lichen urticatus (Bateman), and the prurigo ferox of E. Vidal. Others include the itching states in which the reaction known as lichenisation occurs, and this would enormously increase the group. Lastly, E. Besnier held that "the qualification of prurigo ought not to be restricted to the designation of an anatomical lesion, the papule of prurigo of Willan; it should serve to designate a series of eruptive affections in which the pruritus is the dominant note, or in which the eruption can be of variable aspect," and he suggested the admission of a great number of itching states with multiform reactions to trauma, which he characterised as diathetic prurigos.

**Hebra's Prurigo.**—It was described by Hebra and Kaposi as an independent malady, not contagious and not hereditary, appearing at about the eighth to the twelfth month of life as an urticaria. With the second year of life itching papules are added and gradually take the place of the urticaria, though some wheals may be noticed in later stages, and the special papules are liable to become somewhat urticate. The characteristic picture is constituted in the second or third year. The special papules, firm and about the size of a hemp seed, are uncoloured, many being appreciated only in certain incidences of light and by palpation, or more or less reddened by congestion. They give rise to an itching of variable intensity, but always marked, which compels rubbing, scratching, and tearing, so that they may become urticate, are generally excoriated or capped by a tiny haemorrhagic crust. The papules are disseminated over the body and limbs without special grouping, reaching up over the jaws, but especially implicating the extensor aspect of the limbs, and the lower extremities, whilst the joint flexures remain free as in ichthyosis. A notable feature is the enlargement of the lymphatic glands, especially those in the groins. The papules evolve continuously, sometimes with exacerbations. A chronic malady is established which may be lifelong. In severe cases other secondary changes are produced in the skin, such as extrusion of the hairs, brown pigmentation, fine desquamation, the rugous thickening of the skin described as lichenification, and lastly eczematisation and secondary coccic infections which may mask the primary elements. The physique is deteriorated by the

intensity of the causative trouble and want of sleep, so that the subjects are often characteristically spare and pale. It is said to be better in warm weather. Kaposi pointed out the variation in the severity of the dermatosis, and admits a prurigo ferox and a prurigo mitis. Nevertheless it is an intractable and lifelong affliction. Subsequent experience has shewn that this malady may vary widely in severity and inveteracy, and it is recognised that this prurigo does not invariably commence in infancy, but often in later childhood, and in the latter cases I have noted that the dermatosis does not then commence with an urticaria, but has the special papular type from the first. This observation raises the question if Hebra's prurigo, beginning in early infancy, really starts as an urticaria. J. F. Payne and I have recorded that we have never seen lichen urticatus take on the type of Hebra's prurigo (*vide* also p. 242).

**Prurigo ferox** (E. Vidal and Brocq).—Under this name the authors described a very rare dermatosis. Here the elementary lesions vary in size from a little pea to a small cherry, and feel like a hard nodosity with more or less congested colour. Most are capped with a little collection of serosity. They are disseminated without order, and may arise on the face and scalp. The intense irritation entails a fierce excoriation of the lesions. Lichenification occurs in places, but is not widespread as in Hebra's prurigo. The lymphatic glands are usually enlarged. Brocq has observed it in adult men, who gave a history of attack from early life; also in neurotic women from thirty to forty years of age, who had chronic uterine disorders.

**Prurigo Gestationis.** — Under this name is described an intense pruritus of pregnancy attended by papules, which are said to be similar to those of prurigo. It commences about the third month of pregnancy, and ceases with the confinement. It is said to be clearly distinguished from the so-called herpes gestationis.

**Prurigo of Lymphadenoma.**—Intense generalised pruritus may occur in lymphadenoma and leukaemic disorders, and it may be associated with a prurigo-like eruption. There is some difference of opinion as to the nature of these papules, some observers finding them true prurigo papules, and others of a lymphoid nature like the leukaemic tumours which occur.

**Etiology.**—The causes of prurigo Hebrae are unknown, but many observers regard the affection as a neurosis, especially those who consider the itching and disposition to nutritive disturbance as the essential features, and the papular eruption as secondary. Some suppose an auto-intoxication. Little can be derived from an investigation of the family history. Its usual mitigation in summer has been referred to, and it may improve in hospital without any special treatment. It is certainly much intensified by neglect of hygiene and treatment. Though prone to occur in all classes of society, the poor especially are attacked. It is said to be more frequent in the male.

**Pathology.**—According to Kaposi no particular explanation of the symptoms of prurigo can be obtained by microscopical examination. The slight cellular infiltration of the papillae and the serous exudation

are those of papular eczema, and the changes in the thickened skin are those of chronic eczema. Riehl regarded the papules as of urticarial nature, and Caspary as epithelial papules due to acanthosis. Leloir and Tavernier, on the other hand, described a degeneration of the prickle-cells with consequent cyst formation, containing a clear fluid and a few leucocytes, and this has been confirmed by Kromayer, van Gieson and

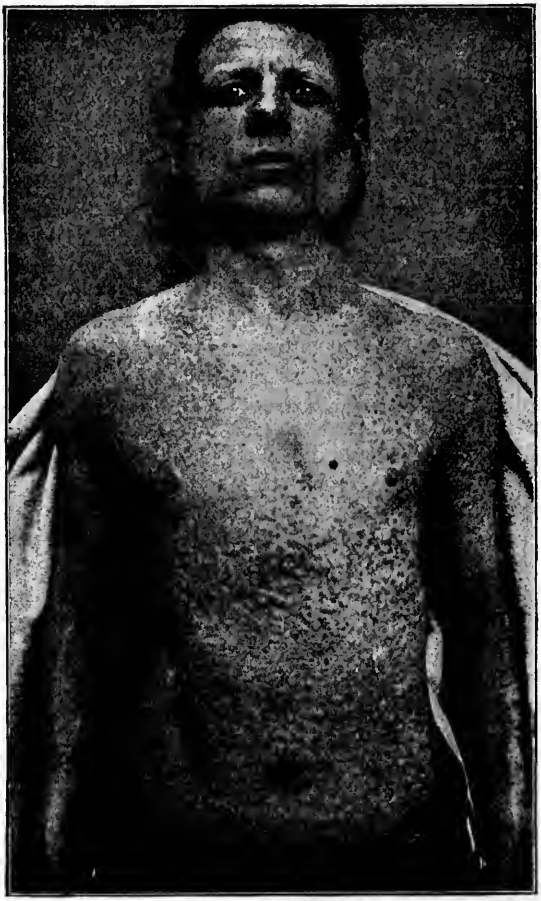

FIG. 63.—Case of lymphadenoma shewing prurigo.

others. Unna says that "if we maintain parakeratosis as an essential symptom of the various forms of chronic eczema, these pruriginous diseases, in spite of the vesicles, belong no more to eczema than to the herpetic diseases." The secondary thickening, however, is common to several itching diseases. He further reconciles, in a measure, the dis-

cordant views of investigators. Every prurigo papule has an urticaria-like basis, for there is a spastic oedema of the cutis, but in addition a proliferative inflammation of the vessel-sheaths, without, however, the formation of plasma cells. Further, as Leloir found, there is a special necrotic softening of the prickle cells, independent of the immigration of leucocytes, forming a vesicle, or sometimes going on to form an impetigo pustule, but one not containing staphylococci. Darier says that the prurigo papule is constituted by a localised acanthosis, oedema and infiltration being almost absent.

**Prognosis.**—Hebra pronounced the grave form described by him as incurable and of lifelong duration, but capable of mitigation by appropriate means. In any case, as Kaposi says, it exercises a baneful influence upon the physical and moral life of the unhappy subject in a thousand directions which will be obvious, not to speak of nervous depression and broken sleep. Observers are agreed, however, that there are many exceptions to this grave outlook, that some cases are less intense than Hebra described, and that the affection is not necessarily of lifelong duration. Kaposi says prurigo can be cured in first infancy only.

**Diagnosis.**—In infancy, before the typical state is reached, it is obvious that the diagnosis from urticaria or lichen urticatus must be very difficult, if not impossible. When the disease is typically established the attentive observer can rarely be at fault, if he studies carefully the history and the character of the papules, the presence of lichenification and eczematisation in inveterate cases, and notes the itching, the distribution, the intractability, and the glandular implication. A real difficulty arises where the primary disease is masked by secondary complications; and it is often necessary to await the healing of the pustulation and eczema before a correct diagnosis can be made from chronic eczema or one of the chronic itching dermatoses, such as scabies, chronic urticaria, pruritus, which may be thus complicated. Further, ichthyosis has a very similar distribution, and may also be masked by eczema.

**Treatment.**—No known specific remedy will cure prurigo, but the affection can be greatly ameliorated by appropriate treatment, which, however, demands persevering efforts and the expenditure of a great deal of time, so that the best results follow in those who are in a position to carry it out most thoroughly. No effort should be spared, especially in the early stages. The details of treatment must depend on the intensity of the malady, the age, and position in life of the patient. In the first place, any eczematous and pustular complications must be dealt with by appropriate methods. The indications thereafter are to improve the nutrition of the patient in every possible way by good hygiene, liberal feeding, and cod-liver oil; to control the itching by certain internal and external measures; and to dissipate any coexistent eruption. It is remarkable how greatly cases improve for the time being by rest in bed with a liberal diet. The itching may be controlled by the use of alkaline, starch, sulphurated potash, or other baths medicated with creolin or izal. Indeed, baths are a very important factor in the treat-

ment, and the local applications to be mentioned will greatly assist. Hatschek speaks well of massage with vaseline. Crocker recommended cannabis indica in full doses, and Blaschko antipyrin. Thyroidin also, it is said, removes the eruption temporarily. Wolff recommends alternate injections of carbolic acid and pilocarpine. Arsenic, Kaposi says, is useless. At Vienna the local remedies most in favour have been sulphur, tar, and soap, and, in recent years, naphthol. In the early stages, and in slight forms, the patient may be washed with sulphur soap, or with sulphur and tar soap, and then placed in a bath for an hour; after this, cod-liver oil, plain or medicated, or some simple fat, is rubbed in. In intense cases the impermeable caoutchouc dressing, or ten or twelve frictions with Wilkinson's ointment, give relief. I have had excellent results from the use of a carbolic acid ointment. In other severe cases the patient can be thoroughly soaped in a warm bath, when either a tar preparation, or Vleminckx's solution, can be applied, and the patient continue for a long time in the bath, or remain in bed with the application still on. Such strong measures, however, need watching, and must be carried out with caution in order to avoid any ill effects. Each evening a slight friction is made with a 5 per cent naphthol ointment (1-2 per cent for children under ten years), and the surface is afterwards powdered. A bath is not necessary, but every other evening a washing with naphthol and sulphur soap may be given in a bath. Besnier insists that the treatment should be persisted in for a long time after the eruption has disappeared. Modern occlusive dressings, such as Unna's glyco-gelatin, or thick zinc creams or pastes, are very serviceable, and, according to French observations, prevent eruptions, though not the pruritus. Jacquet mentions a preparation of yellow wax, 50 grams, gently dissolved by warmth in cod-liver or other oil, 100 grams. This is to be applied thickly, and abundantly powdered. Monti's method consists in cleansing the skin, and thickly powdering it with zinc-salicylic powder; the parts are then covered in with "Mosetig batiste" dressings, and this application is repeated, and the macerated skin cleansed, every forty-eight hours.

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## PRURITUS

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**Definition.**—Pruritus or itching is a cutaneous subjective symptom producing a desire to scratch.

**Introduction.**—As pruritus is a symptom and not a disease, it might at first sight seem to be no more necessary to describe it under a special heading than any other cutaneous sensation. It is, however, a symptom of such importance, and occurs so frequently without any preceding cutaneous lesions that it merits independent consideration. Under the heading of pruritus are grouped several different sensations, such as pricking, tingling, formication or the sensation of insects crawling over the skin, and itching proper.

The subject of pruritus has been complicated and considerable confusion has resulted from the frequent employment of the terms "pruritus" and "prurigo" as if they were synonymous. In the *Précis de dermatologie* in 1909, under the heading of "Neurodermatoses," Darier defined prurigo as "that type of pruritus in which the itching, which is the primitive phenomenon, is accompanied under the influence of scratching by special cutaneous reactions, namely papules of prurigo and lichenification." According to this view prurigo is a special type of cutaneous reaction which occurs in certain individuals as the result of scratching, the primary factor being pruritus and the papules a secondary phenomenon. Hebra and his school, on the other hand, regarded prurigo as a papular eruption in which the primitive phenomenon was urticarial in character, and the pruritus a concomitant subjective symptom. To decide definitely between these rival views is somewhat difficult. There is little doubt that in certain individuals a papular eruption, or the special type of thickening of the skin known as lichenification, may result from scratching or rubbing for the relief of a pre-existing pruritus. On the other hand, cases have been described which resemble papular urticaria of infants, in which urticarial lesions become transformed into papules, and in which the itching is either synchronous with the appearance of the wheal or follows it when it becomes a papule. The pre-existence of urticaria in prurigo has been denied, however, by the majority of observers. Whichever view be taken, there is no more reason for confusing pruritus with prurigo than

for confusing pruritus with eczema, and regarding them as synonymous. In the same way the adjective pruriginous should not be employed as a substitute for pruritic, but should be reserved to designate papular eruptions of the type of prurigo.

For convenience of description the subject of pruritus will be discussed under the following headings :—

I. Secondary Pruritus : Symptomatic of various cutaneous affections.
II. Primary Pruritus : Essential, not preceded by any obvious skin disease. (i) General. (ii) Local.
III. Pruritus Ani.
IV. Pruritus Vulvae.
V. Scratching and its effects ; Lichenification.

I. Pruritus Symptomatic of Various Cutaneous Affections. —Itching to a greater or less degree is associated with a large number of skin affections. This symptom in many instances first attracts the patient's attention to his disease, and but for it some skin diseases would be negligible. It occurs in connexion with erythema, urticaria, eczema, lichen planus, herpes zoster, dermatitis herpetiformis, myoma cutis, sclerodermia, mycosis fungoides, and parasitic diseases such as scabies. These by no means exhaust the list, for it may be present at some time or other in connexion with most forms of dermatitis. The itching varies in degree, according to the extent of the eruption, and the nervous stability and temperament of the individual affected. In one case it may be mild and bearable, whereas in another it may be severe and maddening, leading to scratching, aggravation of the disease with which it is associated, and not infrequently to complications from the inoculation of pyogenetic micro-organisms.

II. Essential or Primary Pruritus not Preceded by Cutaneous Lesions.—Essential pruritus may be (1) General or (2) Regional or local.

(1) **General.**—Pruritus may be more or less generalised over the whole cutaneous surface, and the most careful examination may fail to reveal any pathological change in the skin to account for it, the only objective symptoms present being the result of scratching. It is rare for it to affect the whole cutaneous surface equally, and the itching is usually most intense in one or more areas. The distribution of these areas varies in different cases, and at different times in the same case. As the result of scratching or rubbing the pruritic areas are increased, or new ones assert themselves, either adjoining the original areas or at a distance from them. In certain cases also, through scratching, a localised pruritus may be transformed into one which is more or less diffuse. As in the case of symptomatic pruritus, the itching is rarely continuous, but is subject to paroxysms or crises, and more or less complete intermissions. These paroxysms may come on periodically as

the result of some definite cause, such as exertion, meals, or the warmth of bed; or they may be aperiodical and due to emotional disturbances, auto-intoxication from some poison circulating in the blood, or causes of which the patient is ignorant. The paroxysm may be mild and transient, lasting a few minutes only, so that the patient, provided he has reached years of discretion, can refrain from scratching, and it may be so mild as not to prevent sleep. Should scratching be indulged in, either intentionally or reflexly, during sleep, even mild degrees of pruritus may be aggravated and the patient be wakened thereby. If the paroxysm be moderately severe, and last more than a few minutes, self-restraint generally breaks down, scratching takes place, and a severe pruritic crisis results. When this occurs even the most phlegmatic and strong-willed give way to scratching, and nothing short of a general anaesthetic will prevent it. In severe cases the paroxysm may last for an hour or more, and the pain, even torture, produced by lacerating the affected surface with the nails, or with any rough instrument which may be available, is preferable to the incessant itching. Scratching and rubbing of the skin give temporary relief by numbing the sensory cutaneous nerves and causing a dilatation of the cutaneous capillaries with an exudation of serum. This produces a cessation of the itching, which is associated at first with a feeling of relief and comfort, almost amounting to well-being, and is followed by more or less nervous prostration. To this cycle of sensory phenomena the French have applied the graphic name of "onanisme pruritique." The cessation of itching so produced may last for a sufficient time to enable the patient to get off to sleep. Too frequently, however, the relief is transient, the exudation is absorbed, the capillaries contract, and the itching reasserts itself. Scratching is again resumed, and the patient is wakened up from an imperfect sleep in a paroxysm of itching more severe than the previous one. Where severe paroxysms of itching are frequent by day, and more so by night, sleep is interfered with; and the patient becomes worn-out, irritable, emotional, and hysterical, a mental and physical wreck, and may even seek relief in suicide.

The severity of the itching largely depends on the amount of scratching to which the skin is subjected. In cases in which the pruritus is widely generalised, the most itchy parts are invariably those most accessible to scratching, either by the hands or by the feet. So much is this the rule that it is sometimes possible to tell if the patient is left-handed, by the vigour with which the parts on the opposite side, most easily reached with the left hand, have been scratched.

(2) **Local.**—Pruritus may be limited to certain regions or situations of the body, in which case the itching is much more bearable than when it is generalised. It may be confined to one half of the body, one side, or to a limb; in such cases it is the result of a disturbance of the sensory nerves supplying the affected region, the cause of which may be unknown. The most common sites of localised pruritus are the palms and soles, auricles, nose, mouth and tongue, anus and genitalia, and the hairy regions.

*Palms and Soles.*—Pruritus of the palms and soles not infrequently occurs in elderly people with dry skins, and is usually symmetrical. When it affects the soles, the interdigital clefts are often involved. This troublesome condition is generally believed to be in some way connected with rheumatism or gout, but of this there is no definite proof, and it may occur in individuals without a trace of either affection. It is sometimes present in those who suffer from a feeble circulation, with cold hands and feet, or hyperidrosis.

*Auricles.*—One or both auricles may be the sites of pruritus. In some cases it is the lobe of the ear which is affected, in others it is the auditory canal. When it occurs about the external auditory meatus it is generally the result of an accumulation of wax in the canal.

*Nose.*—The nasal mucosa is occasionally affected with itching and pricking sensations. These may occur just before the onset of a coryza or as a premonitory sign of an attack of spasmodic asthma. It may be caused reflexly by irritation in distant parts, for example, in children when it occurs in association with thread-worms in the rectum.

*Mouth and Tongue.*—The buccal mucosa may be the seat of itching which may involve the lips, tongue, and the insides of the cheeks. This may occur in association with naso-pharyngeal catarrh and occasionally with toothache.

*Anus and Genitalia.*—Pruritus in the ano-perineal region is exceedingly common. It may be present at the anus, at the orifice of the urethra, or about the scrotum, vulva, and vagina. When present at the urethral orifice it is generally the result of urinary troubles, cystitis, diabetes, or gonorrhoea. Pruritus ani and pruritus vulvae are so common, and are capable of producing such distressing symptoms, that it will be advisable to consider them separately.

*Hairy Regions.*—In many individuals pruritus tends to occur in the hairy regions of the body. It is often pronounced around puberty when the growth of the hair is about its maximum. It may attack the beard, the margins of the eyelids, the axillae, the pubes, and, in persons with excessive growth of hair, the chest and arms. Apart from local causes, such as the presence of pediculi or of some form of dermatitis, the pruritus of the hairy parts has been explained as the result of the rich innervation of the pilo-sebaceous follicles. To this type of itching the name " trichomanie " has been applied.

**Etiology and Pathogenesis.**—Pruritus is the result of a functional derangement of the nerves of common sensibility of the skin, in which the elementary sensations are exaggerated or perverted. These sensory nerves when they reach the skin form a subepithelial plexus, consisting chiefly of nerve fibres which have lost their medullary sheaths, and connected with which are groups of ganglia. From this plexus non-medullated nerve fibres pass up between the epithelial cells. According to Dr. Klein these fibres end in minute swellings between the prickle cells, but Unna maintains that many of them pass into the cells and terminate in swellings which are applied to the nuclear membrane. It

is probable that a certain degree of stimulation of these nerves is followed by itching, and that more severe stimulation of them is felt as pain. The causes of pruritus vary indefinitely, and may be grouped under the headings of predisposing and exciting causes, and the latter into external and internal causes.

*Predisposing Causes.*—Idiosyncrasy.—Individuals differ widely with respect to the sensibility of their skins and their capacity to tolerate itching. Whilst certain irritants can produce itching in any skin, others only affect skins which are abnormally sensitive. There is therefore in certain persons an idiosyncrasy or peculiar delicacy of the skin which disposes them to pruritus. This idiosyncrasy may be an inherited condition occurring in families and handed down for generations; it may be an individual peculiarity existent from birth; or it may be the result of ill-health, malnutrition, over-indulgence in alcohol and tobacco, venereal excesses, or mental troubles.

Age.—General pruritus is most common in adult life. It is comparatively rare in infancy and childhood, except as a symptom of some cutaneous disorder such as papular urticaria or eczema. It is frequent in old age when the degenerative changes peculiar to "senile skin have supervened." In elderly people the skin becomes dry, atrophic, smooth, and shiny, or wrinkled like cigarette paper. These changes result partly from the disappearance of the subcutaneous fat, and partly from atrophy of the corium and epidermis. Consequently the fine sensory nerves are badly supported and liable to injury and functional derangements. Such skin is particularly prone to pruritus, which may be local but is more often general in distribution. A peculiarity of this type of skin is that it does not react so readily as the skin of younger people to rubbing and scratching, so that excoriations, eczematisation, impetigo, and the other effects of superficial trauma are rare.

The age of the patient is also some indication of the probable cause of the pruritus. In infants and young children the most common cause of generalised itching is papular urticaria, in young adults scabies, in the middle-aged diabetes, and in old age "senile skin" and pediculi vestimentorum.

*Exciting Causes.*—(1) Internal causes. Pruritus may result from disorders of the blood, alimentary tract, nervous system, and genito-urinary system. The pruritus may be directly produced by the action of toxins circulating in the blood-vessels of the skin, passing into the lymph and so acting directly on the nerve endings. It may be caused indirectly or reflexly by nerve derangements and even by mental impressions, as, for example, when the sensation of itching is called forth by seeing some one else scratch, or from disorders of the internal organs such as diseases of the bladder and uterus.

Pruritus is a recognised accompaniment of general lymphadenoma, pseudo-leukaemia, and chlorosis, and of certain constitutional diseases, such as gout, rheumatism, diabetes, Graves' disease, Bright's disease, internal cancer, and marked obesity. In such instances it is the result

of an auto-intoxication, and is produced directly by the action of some toxin on the nerve endings.

It is commonly caused by disorders of the alimentary tract, such as indigestion, flatulence, and constipation, the pruritus being due to poisons absorbed from the alimentary tract as the result of imperfect metabolism. Certain articles of diet are liable to aggravate pruritus, and may even determine an attack, of these there is a long list, but the most important are: shellfish, tinned fish, oily fish, spices, curries, and highly seasoned dishes, mustard, cheese, sausages, strawberries, tomatoes, acid wines, malted liquors, spirits, and coffee. As a rule, the pruritus by this or that food is the result of an individual peculiarity or susceptibility, unless when the article of diet is taken in excess. When, however, an attack is produced by some kind of food, a susceptibility is established and the smallest quantity of it may be sufficient to cause a subsequent attack. The itching resulting from food or drink may take place after they are absorbed, but not infrequently it occurs almost immediately, and would seem then to be produced reflexly by the contact of the food on the mucous membrane of the upper part of the alimentary tract.

Diseases of the liver are frequently accompanied by intense pruritus. This is generally associated with jaundice, but the degree of jaundice is not proportionate to the amount of pruritus, and the pruritus may precede the jaundice.

Disorders of the nervous system also cause pruritus. It occurs chiefly in association with functional diseases; it may, however, be present in connexion with organic diseases of the brain and cord, such as cerebral tumours, meningitis, general paralysis, and tabes dorsalis. It is most frequently associated with emotional disturbances, such as hysteria, neurasthenia, melancholia; it may also occur in connexion with epilepsy and chorea. The itching may be due to an excessive excitability of the nerve endings in the skin, resulting from the functional or organic disturbance of the peripheral nerves, or it may be reflexly produced by some superficial or deep-seated lesion at a distance from the pruritic area.

Diseases of the Genital System.—Diseases of the uterus and ovaries are prone to produce pruritus reflexly. It may occur in association with menstruation, and occasionally with pregnancy, in which it may be local or general.

Certain drugs which have an antipruritic action on one individual may cause pruritus in another, such, for example, as morphine, opium, and belladonna. This is usually the result of an individual susceptibility to the drug or of excessive dosage.

(2) External Causes.—In addition to the various affections of the skin, in which itching is a constant symptom, there are many external causes which may produce pruritus, such as:—

Extremes of Temperature.—In certain individuals cold is liable to cause itching, and the morning cold bath or a draught of cold air is a common cause of pruritus, and may aggravate it when once established. Itching occurs readily in cold weather, and in some persons recurs each

winter when it is known as pruritus hiemalis. On the other hand, the numbing effect of cold may stop the itching in others, who may obtain relief by cold sponging, or the immersion of the itchy part in cold water.

Heat may also cause itching; almost every form of pruritus is worse from the warmth of bed, and pruritus which may be in abeyance during the day may assert itself whenever the patient becomes warm in bed. This is partly due to heat, and partly to the facility which bed affords for scratching. Persons exposed to high temperatures, such as cooks, stokers, and firemen, not infrequently suffer from itchiness of the skin. The hot weather may also be responsible for pruritus in certain individuals (pruritus aestivalis).

Irritating Underclothing.—In sensitive skins itching is readily produced by any irritating form of underclothing with a hairy surface, such as woollen or flannel garments; in the same way sleeping between blankets is apt to cause it.

The relief of pressure and constriction is often accompanied by pruritus. For example, itching is often experienced in women when the clothes are removed, and the constriction produced by the corsets, garters, or tight boots relieved. This is mainly due to the dilatation of the blood-vessels which takes place when the pressure is removed.

Local Irritants.—An infinite number of local irritants may cause itching. These may be of (i) animal origin, for example, bites of insects, such as ticks and mosquitoes, stings of bees, wasps, spiders, caterpillars, jelly-fish, or the presence on the skin of pediculi or the acari of scabies, (ii) of vegetable origin, such as poisonous plants, certain bacteria, and the fungi of ringworm and favus, and (iii) of chemical origin, such as iodoform and tar. There are, in addition to these, all the irritants which are responsible for the different forms of trade eczemas, such as flour in baker's itch, sugar in grocer's itch, and soda in washerwoman's eczema.

Soap may also act as an irritant, and the abuse of it is liable to aggravate and even produce pruritus. This is due to the action on the skin of the free alkali which is eliminated when the soap undergoes decomposition with water, and is specially liable to occur in situations, such as the anus and vulva, where the epidermis and mucosa are apt to be abraded and the nerve-endings to be exposed.

**Diagnosis.**—The only point of importance in connexion with the diagnosis of pruritus is the necessity of distinguishing between pruritus due to various internal causes and independent of objective skin disease, and that which is symptomatic of some skin affection or results from local irritation. In connexion with pruritus due to internal disorders or nervous derangements, scratching and rubbing may have resulted in excoriations and impetigo from the inoculation of pyogenetic micro-organisms, lichenification, or eczematisation, and these may mask the diagnosis. In any case of generalised itching the most careful search should be made on the skin and underclothing for parasites, or for any other source of local irritation; if the search be negative, the urine should be examined for sugar and albumin and the output of urea estimated, as

diabetes, Bright's disease, and faulty metabolism are among the most common causes of pruritus.

The **prognosis** in pruritus depends on the successful removal of the cause. When the pruritus is a symptom of some cutaneous disorder it will persist so long as the skin disease remains uncured, and when it is due to some form of local irritant, parasitic or otherwise, it will remain until the irritant be removed. When due to internal derangements its duration will correspond with that of the underlying morbid condition. Once a severe attack of generalised pruritus has occurred an individual vulnerability may be established by which subsequent attacks are liable to occur as the result of irritants of a less degree of virulence than that which produced the original attack. In every case, however, the pruritus can be relieved if not completely removed by suitable treatment.

**Treatment.**—The successful treatment of pruritus depends on the recognition and elimination of the cause, and, therefore, varies indefinitely in different cases, and each case must be treated on its own merits.

*General Management.*—In every case of pruritus as a prelude to treatment it is essential to make a thorough examination of the skin in order to detect any local cause, whether it be a cutaneous disease or some local irritant; and if the result of the search be positive the treatment then resolves itself into that suitable for the responsible skin disease, or consists in the removal of the local irritant and the elimination of its effects. In the absence of any evidence of cutaneous disease or of local irritation, a careful physical examination of the patient should be made to discover any defects in the digestive, nervous, or genito-urinary systems. Special attention should be directed to the examination of the liver, the urine, and the faeces. On general principles any defect of health should be combated by suitable remedies. Indigestion in all its forms should be treated on general medical principles. Constipation is liable to keep up the pruritus, and should be dealt with by regulated exercises, suitable diet, draughts of hot water, salines, or vegetable laxatives, such as cascara sagrada; aloes should not be prescribed as it is apt to irritate the rectum and may set up pruritus ani. Toxins absorbed from the lower part of the alimentary tract not infrequently cause pruritus; these may be counteracted or removed by small doses of calomel at night, followed by a saline draught in the morning, or by lactic acid 5 to 10 minims three times a day, salol 5 to 10 gr. three times a day, or ichthyol 5 grs. twice a day on an empty stomach. In certain cases of this type a course of soured milk properly prepared from a ferment containing the true Bulgarian bacillus may be taken with advantage. Disorders of the liver with or without jaundice should be properly treated. The urine should be examined for sugar or albumin in order to detect any organic or functional defect in the kidneys and a careful examination of the blood should also be made. The nervous system should also be examined in order to detect any disorder capable of producing pruritus. Apart from definite nervous lesions, the sufferer from generalised pruritus is frequently neurasthenic, irritable, depressed, and incapable of sustained and con-

centrated mental effort; in these cases tonics, such as iron, strychnine, quinine, or arsenic, are indicated; but more important than these is the mental and physical improvement which can be obtained by rest, in bed if necessary, or by an outdoor life, exercise without fatigue, games which, like golf, absorb the attention of the player, and change of air, scene, and associates. The diet should be plain, simple, and nutritious, and anything approaching excess must be avoided; alcohol in all its forms should be given up, and coffee forbidden; freshly infused and weak tea may usually be taken with impunity; meat should not be taken more than once a day, and some patients find it advisable to give it up altogether and resort to a vegetarian diet with plenty of milk. Green vegetables as a rule are harmless, but potatoes and other starchy vegetables may have to be avoided as they are difficult to digest. Considerable benefit may be derived from flushing out the system by copious draughts of slightly alkaline mineral waters, and, where possible, the benefit may be increased by a sojourn at some spa, such as Harrogate, Bath, Buxton, Contrexéville, Vichy, Ems, Aix-le-Bains, Marienbad, or Carlsbad. Smoking in moderation is as a rule permissible, provided the smoke is not inhaled, but it must be forbidden in certain cases as it is apt to produce paroxysms of itching.

Every detail should be considered to ensure the comfort of the patient by reducing the sources of local irritation. The underclothing should consist of silk, silk and cotton, or linen; woollen garments or flannel with a hairy surface should never be worn next to the skin. In cold weather, however, warm woollen garments may be worn outside the silk or linen underclothing.

Another important consideration in connexion with the general management of severe cases of generalised pruritus is that the bedroom should be kept cool and at an even temperature. The bed-clothes should be light, and may be raised off the patient by means of a cradle which can be ventilated by the employment of paper shafts placed on each side of the bed. The sheets should be made of old well-worn linen, and the night-dress should be made of thin linen or lawn in preference to any woollen material, and, as a rule, night-gowns are preferable to pyjamas.

*Internal Treatment.*—There cannot be said to be any reliable internal specific against pruritus. Numerous drugs, however, have been recommended for this purpose, indeed the length of the list is of itself enough to indicate the uncertain action possessed by any of them. The most commonly employed are valerian, carbolic acid, atropine, and arsenic. Valerian may be prescribed in the form of a tincture in doses of a dram three times a day, carbolic acid in pill form or in a mixture containing two grains to the dose, atropine in the form of the liquor atropinae sulphatis 1 to 2 ♏, and arsenic in doses of 2 to 8 ♏ of the liquor arsenicalis. Of these the best is probably valerian, but they are all uncertain and may do more harm than good. Nerve sedatives and analgesics have been more or less extensively used, such as sulphonal, chloral hydrate, the bromides, and antipyrin. Although these drugs all ease the pruritus temporarily they are depressing in their action, and

when their effect wears off the patient is less able to bear the pruritus should it return, hence they should always be prescribed with the utmost caution, and should be reserved for cases in which insomnia is a prominent feature. Opium in any form should not be given as it may produce pruritus and has the same depressing effect as the others. On the whole, more reliance should be placed on internal treatment carried out on general principles than on any so-called internal specific.

*External Treatment.*—External remedies play the most important part in the treatment of pruritus, and are capable of subduing, if not of completely removing, it. It is by the judicious combination, however, of proper local treatment with suitable general management that the best results can be obtained.

The *local treatment* may be considered under the headings of chemical and physical methods.

Chemical Remedies. — As the number of chemical antipruritic remedies is legion, those only will be mentioned which I have found to be most serviceable, namely, menthol, alcohol, camphor, ichthyol, carbolic acid, opium, tar, and lead. The choice and mode of application of these are determined by the degree and extent of the pruritus. In many instances it is the proper application of the remedy rather than its composition which determines its efficacy. It must be remembered that, as toleration to any individual drug is readily established, the physician should have a considerable store of suitable remedies, so that he may judiciously change them should they lose their effect. Further, as an application which suits one case will be ineffective in another or may even act as an irritant, it is necessary to find out in the first instance the remedy which will best suit the individual case and to continue its use so long as it acts beneficially.

In extensive pruritus the most useful method of applying the above drugs is in the form of lotions, creams, or dusting powders.

Lotions.—The following lotions will be found to be useful: ℞ Carbolic acid (1 in 40); carbol-glycerin (1 in 20); carbolic acid gr. xx., spirit. vini rect. ʒii., glycerin ʒi., water to ℥i.; carbolic acid ♏x., liquor potassae ♏v., water to ℥i.; carbolic acid ʒi., zinc oxide ʒiii., prepared calamine ʒi., glycerin ʒiii., lime water ℥i., rose water to ℥iv.

Evaporating Lotions.—Eau de Cologne; lavender water; or rectified spirit. These may be applied undiluted, or diluted with various percentages of water, and, as they act in virtue of their power of evaporating quickly, to be effective they should be applied frequently.

Tar.—Of the tar lotions the simplest may be obtained from the coal-tar products, such as the liquor picis carbonis or the liquor carbonis detergens in the strength of about 10 ♏ to the ounce of water. The liquor picis alkalinus of Bulkley is also a useful remedy, and consists of pix liquida ʒii., caustic potash ʒi., and water ʒv. In preparing this the potash is dissolved in the water and rubbed up with the tar in a mortar until perfect solution is effected; this is then diluted with water, about 1 in 15, and applied over the surface.

Lead.—The following formulas are useful:—℞ Liquor plumbi subacetatis ℥ss., liquor carbonis detergens ℥iiss.; sig. a teaspoonful to be added to half a pint of tepid water for use. ℞ Liquor plumbi subacetatis ♏xv., lavender water ℥i., water to ℥i.

Opium is another valuable antipruritic remedy, and may be employed in the following lotions: Extract of opium ♏v., hot water ℥i.; tincture of opium ♏xv., camphor gr. xxx., almond oil ℥i.; sulphate of morphine gr. ii., borax ℥i., rose water ℥i. Alkaline lotions, consisting of borax, bicarbonate of sodium or carbonate of potassium, 10 to 15 gr. to the ounce of water, are valuable in cases in which large areas are affected.

Ichthyol has an antipruritic action, and may be employed in a lotion consisting of 1 to 4 per cent in water, 50 per cent alcohol or olive oil.

The antipruritic action of these lotions may be intensified by the addition of menthol 1 per cent, dilute hydrocyanic acid 1 per cent, or hydrochloride of cocaine 2 per cent. Of those remedies carbolic is probably the most useful. Ichthyol is of benefit as it tends to dry and form a film on the skin. Menthol lotions should be used with caution, as although they have a powerful antipruritic action they are apt at the same time to cause inflammation. All these lotions should be applied by means of a single layer of lint soaked in them, laid over the affected surface and kept moist by spraying or pouring on a little more lotion every few minutes. In some cases relief may be obtained by covering the lint with waterproof, but this usually makes the part too hot, and more comfort can be got by allowing free evaporation to take place.

Creams.—By applying remedies in the form of creams or oils the effect lasts longer than if they are employed in the form of lotions. The simplest base is olive oil, to which may be added 1 to 2 per cent of carbolic acid, menthol, or ichthyol. An extremely useful base for a cream is the time-honoured cremor calaminae, which contains: prepared calamine ℥ss., zinc oxide ℥ss., lime water ℥iii., almond oil to ℥i. Emollient remedies of this nature are especially useful in senile pruritus.

Powders.—Powders exert a cooling effect on the skin by absorbing moisture, and at the same time protect it from the atmosphere and friction. The most useful dusting powders contain as bases: oxide of zinc, magnesium carbonate, bismuth subnitrate, and starch; and to these or to any combination of them may be added 10 per cent of camphor which is definitely antipruritic. Care should be taken in the preparation of them that they are powdered down as finely as possible. The different natural earths which have been much advertised are also useful, but it is necessary to be careful that they have been properly sterilised in case they should contain tetanus bacilli.

In pruritus, localised to one or more patches, a more lasting effect may be obtained by applying remedies in the form of ointments, pastes, or varnishes. The external antipruritic remedies mentioned above may all be used in this fashion, and to those may be added others, such as chloral hydrate, conium, and cannabis indica. One of the best bases for an antipruritic ointment is a well-made cold cream, such as:

℞ Lanoline ʒi., cera alba ʒi., almond oil ℥i., rose water ℥i.; or lanoline ʒii., benzoated lard ʒiv., rose water ʒvi. To an ounce of either of those creams may be added, menthol gr. v., hydrochloride of cocaine gr. x., extract of cannabis indica ʒi., extract of conium ʒi., or chloral hydrate ʒi. To stiffen the ointment one or two drams of zinc oxide may be added. Occasionally it is an advantage in situations exposed to friction to employ instead of the cold cream base a paste such as that suggested by Lassar, containing equal parts of zinc oxide, starch, lanoline, and vaseline.

When the pruritic areas are small, varnishes and gelatins are particularly serviceable. As an example of a useful base for a varnish Klingmüller suggested the following: ℞ zinc oxide ʒii., glycerin ʒii., starch ʒii., rectified spirit ℥ss., water ℥ss. To this may be added ichthyol or balsam of Peru 2 per cent.

An excellent gelatin base is that of Unna: gelatin ʒii., glycerin ʒiv., zinc oxide ʒiii., water ℥i. The gelatin is melted in the water, the glycerin and zinc rubbed up together in a mortar, and the various constituents incorporated in a water-bath. This sets on cooling and requires to be melted before being applied. It should be painted on with a brush and allowed to dry over the skin like a piece of kid glove. To it may be added ichthyol or sulphur 1 to 2 per cent.

*Physical Methods.*—Hydrotherapy.—The application of a sponge wrung out of as hot water as can be borne gives temporary relief, especially when the itching is localised. Hot baths, and vapour or Turkish baths, may stop the itching and act by causing dilatation followed by a constriction of the cutaneous capillaries. Benefit may be obtained by the addition to a hot bath of bran, oatmeal or linseed meal 2 lbs., carbonate of sodium or borax 2 ozs., gelatin ½ lb., or starch 1 lb., to the 30 gallons of water. These are not invariably successful, and in some cases do actual harm by being followed by an exacerbation of the itching. Tepid douches or sprays applied along the vertebral column for 5 to 15 minutes daily are worth a trial. Cold water either in the form of whole or partial baths is apt to do more harm than good. Occasionally benefit may be derived from the employment of cold compresses or cold sprays or douches especially when followed by the application of an evaporating alcohol lotion or a dusting powder.

*Electrical Methods.*—In cases of localised pruritus a certain amount of relief may be obtained from the brush discharges from a high-frequency apparatus, and from faradisation in the form of a faradic brush or a faradic bath. Of far greater value, however, than either of these is the judicious application of the *x*-rays, about half of a Sabouraud pastille dose being given, and repeated the following day if necessary.

III. Pruritus Ani.—The name "Pruritus ani" is usually reserved for an affection characterised by itching at the anal orifice, extending internally about an inch up the rectum, and externally involving the puckered circular area corresponding to the corrugator cutis ani muscle. Since the mucous membrane and the skin at the anal orifice are richly

supplied with sensory nerves, the anal region is particularly liable to pruritus, even more so than other regions of the body. The pruritus may be mild and transient, but is often intense and prolonged, and the paroxysms may be so severe and frequent as to interfere with sleep, impair the general health, cause the sufferer to shun the society of his fellows, and to establish neurasthenia.

The pruritus is rarely continuous, and usually shews intermissions and exacerbations brought on by numerous external and internal causes. The scratching which is indulged in, though it may cause temporary relief, usually intensifies subsequent paroxysms and leads to excoriations of the skin and mucosa, ulceration, and occasionally lichenification. The skin about the anus becomes inflamed, thickened, and sodden from an offensive rectal discharge, is broken up by radiating fissures, and, as a result of secondary inoculation of pus-organisms, may present ulcerations and warty ridges. In old-standing cases it often becomes thin, pale, dead-looking, and tough like parchment or wash-leather. At other times the skin, not only around the anus but over the whole perineum, may become eczematised, inflamed, oedematous, moist, raw, hot, or even painful.

**Etiology.**—Pruritus ani is a symptom and not a disease. It depends chiefly on local causes, though it may occur in association with constitutional derangements, and the most careful search may fail to reveal any local condition which might be responsible for it.

*Sex.*—It is more common in males than in females, possibly because males are more prone to excessive indulgence in eating and drinking.

*Age.*—It may occur at any age, but is most frequent in middle life and in elderly people. There is a certain relation between the age and the cause likely to be responsible for it. For example, in children it is due to intestinal worms; in young men to sedentary occupations and congestion of the haemorrhoidal vessels; in young women to vaginal discharges; in middle-aged men to constipation, haemorrhoids, and fistula; in middle-aged women to neuroses associated with the menopause; and in old age to feeble circulation and to venous engorgement.

*Internal Disorders.* — The same internal disorders which produce generalised pruritus may also cause pruritus ani; for example, disorders of the alimentary tract, especially constipation, liver derangements, impaired digestion brought about by rich and indigestible foods, and general diseases such as diabetes, gout, and rheumatism. It may also result from indulgence in alcohol and coffee and excessive smoking. The pruritus may be caused directly by congestion of the haemorrhoidal vessels due to imperfect action of the liver, or it may be brought about reflexly and occur almost immediately after taking coffee, alcohol, or some form of food which is difficult to assimilate.

*Local Affections.* — The most common causes of pruritus ani are local, especially affections of the rectum, such as catarrh with an offensive discharge due to chronic proctitis, the presence of thread-worms or of hard, dry, faecal masses, lesions in the mucosa such as small polypi,

collections of irritating matter, and ulcers or fistulous openings in the anal pockets or valves of Houston. It may also be set up by haemorrhoids, and not infrequently by small superficial ulcers or cracks situated between the sphincters. Other important causes are imperfect cleanliness about the anus, and incomplete evacuation of the sigmoid flexure and rectum resulting from the unnatural position usually adopted in defecation necessitated by the ordinary seats of water-closets.

Diseases of the genitalia, such as gonorrhoea and leucorrhoea, and disorders of the bladder and uterus, may cause pruritus ani either directly or reflexly. Tumours in the rectum or pelvis by obstructing the venous circulation may also be responsible for it. Skin affections beginning near or encroaching upon the anus, such as boils, eczema, and psoriasis, are apt to be associated with it.

**Treatment.**—Most cases are curable if treated early and the cause discovered and removed. But when treatment is delayed until the skin has become thickened or eczematised, the nerves, being pressed upon by the indurated skin, may remain in an excitable state, and the itching may persist in spite of the removal of the cause. In every case, as a preliminary to treatment, the anal region and the rectum should be properly examined for haemorrhoids, blind fistulas, ulcerations, polypi, or other possible local causes; failure to do this has often caused the patient unnecessary suffering and brought discredit on the physician.

*General and Preventive Treatment.*—One of the most important preventive measures is scrupulous cleanliness after defecation, with the removal of all faecal matter or mucous discharge about the anus. This cannot be effected satisfactorily by paper; and when coarse paper is employed, the rubbing entailed by its use may produce irritation. Instead of paper a pad of cotton-wool, moistened in water, should be employed; and the part should then be dabbed dry and a simple dusting-powder applied. Constipation is one of the important causes of this distressing complaint, and must be treated on general medical principles. What has been said with regard to the diet in pruritus in general is equally applicable here; and alcohol, coffee, and excessive smoking should be forbidden. Any obvious disorder of the liver, intestines, or genito-urinary system must be treated on general principles. When the patient is depressed, irritable, and neurasthenic, a tonic regime is indicated, with change of air, outdoor exercises, of which horse-riding and cycling are of special value, and healthy surroundings; in markedly neurotic cases with lack of self-control hypnotic suggestion has been recommended and is worthy of a trial.

*Local Treatment.*—In the first place any local lesion about the rectum must be suitably dealt with. Catarrh should be treated by washing out the rectum with weak solutions of boric acid, thread-worms should be removed, haemorrhoids treated, small redundant tags of mucous membrane snipped off, and ulcers and fissures destroyed by touching with silver nitrate, lactic acid, or the thermo-cautery. The pain associated with the latter procedure may be deadened by the previous injection of cocaine

behind the ulcer, and the insertion of a morphine suppository after the cauterisation. Except when the ulceration is extremely slight, it is essential for its successful treatment that the patient should be confined to bed for at least a week after the operation. Small fistulas opening into the rectal pockets should be opened up, and the valves of Houston divided.

If the skin about the anus be thickened, permanent relief cannot be obtained until the induration is reduced. This may be done by painting the part with 95 per cent carbolic acid, which causes the epidermis to peel off, leaving a tender surface, to which zinc oxide ointment should be applied; salicylic acid 6 per cent in 50 per cent alcohol may be used for the same purpose, but is less effective. Ironing the part with the actual cautery at a dull-red heat has been recommended, but this procedure is painful and necessitates a general anaesthetic. After the application of the cautery the part may be soothed by a lotion of bicarbonate of sodium 1 in 8, followed by zinc oxide ointment and a cocaine suppository introduced into the rectum. Any small warty excrescences should be destroyed by the cautery or cut away, and the part allowed to granulate. The other effects of scratching and rubbing, such as superficial pus-infections and eczematisation, must also be treated by appropriate remedies. In obstinate cases excision of the thickened perianal skin has been suggested, after which the surrounding skin is undermined, drawn over the denuded surface, and stitched to the rectal mucosa. This operation, though sometimes successful in the hands of an experienced surgeon, is rarely necessary, and is likely to be followed by serious results if attempted by the novice.

In a considerable number of cases, however, no definite lesion can be detected in the anal canal or rectum, and in others the pruritus still persists after the local source of irritation has been removed. In these cases the employment of some local application to relieve the itching is demanded. The number of remedies which have been recommended for this purpose is almost infinite. As in the case of ordinary pruritus, what will suit one case will be ineffective in another, and a toleration to this or that remedy is readily established. Consequently it is necessary to consider each case on its own merits, to find out the application which suits it best, and to use that till it loses its effect. It is advisable in the first instance to begin cautiously by applying a bland ointment or paste rather than to run the risk of employing a stronger remedy which might prove harmful and irritating. Lassar's paste, containing equal parts of zinc oxide, starch, lanoline, and vaseline, with or without the addition of 2 per cent of salicylic acid, is an admirable application in mild degrees of pruritus ani, as it not only relieves the itching but, by forming a thick coating about the anal orifice, protects the parts from friction and scratching. The most useful antipruritic remedies for this affection are carbolic acid, menthol, ichthyol, chloroform, tar, and belladonna.

Carbolic acid may be prescribed in olive oil, glycerin, or vaseline, in the strength of 1 in 20. Its antipruritic action may be augmented by

combination with sodium hyposulphite as in the following lotion: ℞ Carbolic acid ♏x, sodium hyposulphite ʒii., glycerin ʒii., water to ℥i.

Cocaine may be used as a lotion or ointment in the following formulas: Hydrochloride of cocaine ʒi., cherry laurel water ℥ii., rose water to ℥vi.; or hydrochloride of cocaine gr. xv., zinc oxide ʒii., soft white paraffin to ℥i. Cocaine may also be applied as a suppository containing half a grain of the hydrochloride. This gives considerable relief as regards the itching, but in employing it, as in the case of morphine suppositories, it is important to remember that there is a danger of relieving the pruritus at the expense of establishing a morphine or cocaine habit.

Menthol may be applied as a 2 per cent solution in olive oil or 50 per cent alcohol, but its action is more lasting if it be prescribed in the same strength in zinc oxide ointment. As menthol, if persistently used, is apt to inflame the skin, it should only be occasionally applied. Tar is a valuable remedy for this affection, and may be employed in the form of the liquor carbonis detergens or the liquor picis carbonis, a teaspoonful to half a pint of tepid water, and the strength increased if desired; or as ointments such as: ℞ Oil of cade ʒi., vaseline to ℥i.; or unguentum picis ʒii., unguentum belladonnae ʒii., unguentum rosae ʒii. Chloroform may be prescribed in the form of an ointment consisting of chloroform and vaseline, or in the same strength in almond oil. Mercury is of value where inoculation of pyogenetic micro-organisms has taken place from scratching. It may be dusted on as calomel, or applied as black wash diluted with equal parts of lime water, or in the form of an ointment such as ammoniated mercury and vaseline.

Ichthyol may be used as a 2 per cent lotion in water or 50 per cent alcohol or in the following ointment: ℞ Ichthyol gr. xv., zinc oxide ʒii., vaseline to ℥i.

Suppositories of cocaine and morphine have already been mentioned, and the necessity of caution with regard to their use pointed out. When employed occasionally they are of great value, especially where the pruritus interferes with sleep, and are useful in preventing the scratching which takes place reflexly during sleep, and which may easily undo the benefit derived from the most careful local treatment during the day.

*Electrical Methods.*—Various electrical measures have been employed for the relief of this affection, with greater or less success. Of these the most important are high-frequency currents, cocaine or zinc ionisation, and the *x*-rays. Zinc ionisation is of special value where superficial abrasions are present. The proceeding is simple, and consists of applying a piece of lint the size of a penny soaked in 2 per cent sulphate of zinc solution to the affected skin. To the positive pole of a galvanic battery a solid zinc electrode with a rounded surface and a diameter of about an inch is attached, which is pressed against the moistened lint, the negative electrode, consisting of a metal cylinder covered with wash-leather and moistened in salt solution, being held by the patient. A current of a few milliamperes is then passed for ten minutes. This has a definitely astringent action, causing the superficial abrasions to heal and sometimes

relieving the irritation. Cocaine has also been employed in the same way, the lint being soaked in a 2 per cent solution of cocaine instead of in zinc sulphate solution. This is said to produce a more marked anaesthetic effect than can be obtained by applying the cocaine in a lotion or an ointment. The *x*-rays are the most useful of all the electrical methods, and not only possess a definite antipruritic action but at the same time reduce the thickening. A full Sabouraud dose should be given, and, if necessary, this should be repeated in a month. Radium has also been found to be of value in the treatment of this affection (Wickham and Degrais).

IV.—Pruritus Vulvae is another form of localised pruritus which merits special consideration on account of the intensity of the local symptoms associated with it. The pruritus, although more or less continuously present, is increased by warmth in bed and by friction from movement. It may be so intense and persistent as to prevent sleep and to cause extreme nervous depression, neurasthenia, and even hysteria. In mild cases the affected parts feel itchy; in severe cases they may feel hot, burning, raw, or actually painful. The first objective signs of the trouble are inflammatory in character, and occur on the inner surfaces of the labia and around the clitoris. The inflammation may remain localised to the vulva or may spread on to the surrounding skin and gradually involve the whole perineal region, even passing up for a short distance inside the vagina. As a result of scratching the affected area becomes excoriated and thickened, and, should mucous discharges from the vagina be present, it assumes a peculiar sodden appearance. Eczematous changes may supervene and a most distressing condition be produced, with inflammation, oedema, weeping, and crusting, which is too often allowed to become far advanced before medical aid is sought. In long-standing cases, especially in elderly people, the skin undergoes kraurotic changes and becomes white and dead like parchment, and may pass into a condition of squamous-celled carcinoma (*vide* p. 571).

**Etiology.**—Pruritus vulvae may be due to numerous causes, the most important of which are the following: Irritating discharges from the vagina and uterus, such as occur in leucorrhoea and towards the end of the menstrual period, the collection of smegma about the labia minora, want of cleanliness and the accumulation of dirt, superficial ulcers and tender spots about the inner surfaces of the vulva, and parasites, such as pediculi pubis or threadworms, about the anus and vagina. Skin affections involving the vulva, such as eczema and furunculosis, may also cause it, but these conditions are more often secondary to the pruritus, and the result of scratching and the inoculation of pus cocci. Urine if irritating from hyperacidity or the presence of sugar is a common cause of pruritus vulvae, and the affection not infrequently occurs about the time of the menopause, as the result of a temporary glycosuria or "climacteric diabetes." Pregnancy, as a result of the associated venous engorgement, is another potent cause of the condition.

As in pruritus ani, no definite local lesion can be detected in a certain number of instances. In these cases there is generally a high degree of neurosis, and in some of them it is probable that a slight local cause induced the habit of scratching, and that this in turn, by irritating and altering the skin, perpetuated and increased the pruritus.

**Treatment.**—The successful treatment of this condition depends on the recognition of the cause and the removal of its effects. Where no definite cause can be detected, local antipruritic treatment is indicated, and, as the patient's health is not infrequently impaired, any defect in the general condition must be dealt with on general medical principles. With the object of removing the cause, the parts should in the first instance be carefully examined for possible local lesions, such as ulcerations, tender inflamed spots, discharges from the vagina, smegma, or parasites; and the urine should be tested for hyperacidity and sugar. Should any local cause be detected it must be thoroughly dealt with by suitable means. Small ulcerations should be touched with pure carbolic acid, silver nitrate, or the thermo-cautery, and a soothing paste subsequently applied; discharges and catarrhal states of the vagina should be treated by antiseptic douches, such as lotions of boric acid, potassium permanganate (1 in 5000), or zinc sulphate (1 in 1000), and a vaginal tampon inserted to prevent the discharge escaping and irritating the inflamed area; smegma should be thoroughly removed and scrupulous cleanliness enjoined; threadworms should be got rid of and pediculi pubis destroyed by cutting the hairs and applying carbol-glycerin 1 in 8, or a dilute ammoniate of mercury ointment. Concomitant cutaneous affections, such as eczema and boils, must be treated by appropriate means. Where the urine is hyperacid, alkalis should be prescribed, and where sugar is present, as in the case of climacteric diabetes, much benefit can be derived from opium internally in doses of 1 gr. three times in the day with 2 gr. at bed-time. In severe cases of pruritus, especially those occurring in pregnancy or associated with ulcerations necessitating cauterisation, the patient should be confined to bed until the pruritus can be relieved. The diet should be of a bland character, and all those foods which have been referred to as being harmful in connexion with pruritus in general should be avoided (*vide* p. 280), and alcoholic stimulants and coffee forbidden. The bowels should be regulated and kept slightly loose by laxatives, and the kidneys flushed out by lithia or other alkaline mineral waters. Tonic treatment is indicated in those who are anaemic and run-down, and the neurasthenia which so frequently accompanies and intensifies the pruritus should be dealt with by moral persuasion, general massage, and a proper hygienic regime. When the itching is so severe as to cause insomnia, general sedatives, such as chloral or bromide of sodium, may be resorted to, but the prescribing of these should always be done with caution in view of the risk of establishing a drug habit. It is advisable to avoid the use of morphine in such cases, as it is uncertain in its action, unless given in large doses.

*Local Treatment.*—When no definite cause has been detected, or when

the itching persists after the removal of some local source of irritation, one or other of the various local remedies for pruritus are indicated. Hot water in the form of sitz baths, or applied by a sponge wrung out of it as hot as can be borne, generally gives relief; after drying the parts a dusting powder should be applied and the vulva covered by a pad of cotton-wool fixed by a T-shaped bandage.

Numerous local antipruritic remedies have been employed in this condition, such as carbolic acid, menthol, chloroform, tar, chloral, and cocaine. Carbolic acid may be prescribed in the form of a lotion, and for severe cases the following mode of application has been recommended by Dr. M'Cann. A number of strips of lint three inches long are soaked in carbolic lotion (1 in 20) and inserted for an inch into the vagina, and the remainder spread over the labia in such a way that the whole of the pruritic area is covered by the moistened lint, a large pad of boric acid wool being then applied over the vulva and fixed with a T-shaped bandage. This may be left on for a whole night and fresh strips then applied if necessary. In place of the carbolic lotion, menthol in a 2 per cent solution in almond oil may be substituted and dabbed on to the affected parts. Where the skin and mucosa are raw and sore the smarting caused by carbolic and menthol lotions may be so intense that they have to be discontinued and milder applications employed. A valuable remedy, when the inflamed spots are few and the affection is confined to the mucosa, is methylene blue, which should be painted on in the form of a 1 per cent solution. On the whole, however, in the treatment of this affection, ointments or pastes are more useful than lotions, as, apart from the medicament they may contain, they have a beneficial action by protecting the parts from friction and from the action of vaginal discharges. As a base for an ointment equal parts of soft white paraffin and lanoline may be employed, and for a paste equal parts of zinc oxide, starch, lanoline, and vaseline. Another useful base, especially where the skin is being irritated by sugar in the urine or discharges from the vagina, is the B.P. casein pigment, which is in the form of a thick white emulsion and forms a protective coating or varnish which is porous and elastic and dries on the skin. The formula for this is: ℞ Casein 14 parts, potassium carbonate ½ part, glycerin 7 parts, soft paraffin 21 parts, zinc iodide ½ part, carbolic acid ½ part, distilled water to 100 parts.

As a rule, the zinc paste forms a more comforting base than the vaseline and lanoline, and is especially valuable when the parts have become oedematous or eczematised. To the ounce of one of these bases may be added 2 per cent of carbolic acid or menthol, or 3 per cent of ichthyol, hydrochloride of cocaine, or ammoniated mercury. Other ointments also give relief, such as chloroform ointment, consisting of chloroform and vaseline, and tar ointments, such as: ℞ Oil of cade ℥i., vaseline to ℥i.; or liquor picis carbonis ♏xv., zinc oxide ℥ii., vaseline to ℥i.

For some time after the pruritus has subsided it is advisable to apply a perfectly bland preparation as a protective against friction, such for example, as the zinc starch paste.

In cases in which the mucosa and skin are thickened it is necessary to reduce the induration in order to get rid of the pruritus; this may be done by smearing the thickened patches with pure carbolic acid once or twice a week after drying the surface with a piece of cotton wool, or by the thermo-cautery. The latter procedure is painful and necessitates a general anaesthetic. In inveterate cases in elderly people, in which leucoplakia is present and a tendency to undergo malignant changes, more radical treatment is advisable, and the affected skin and mucosa should be excised and the edges brought together and sutured.

As in pruritus ani, the *x*-rays are a valuable means of treatment, and thickened patches associated with much itching respond well to them. A Sabouraud pastille dose should be given, and repeated in a month or six weeks if necessary. This not only reduces the thickening, but has a marked antipruritic action. Radium has also given good results in this affection, short exposures with a flat apparatus being given on consecutive days (Wickham and Degrais).

V. Scratching and its Effects.—The immediate effect of scratching or rubbing is inflammation of the skin, with redness and more or less exudation of serum producing an interstitial oedema. Trauma due to the nails or some rough instrument leads to the production of linear or punctiform excoriations. The latter result from the scratching of the tops of the congested and prominent papules which are formed at the orifices of the hair follicles. These excoriations may bleed or discharge a serous exudation which dries into crusts. In some cases the irritation is so severe that relief is only obtained when the offending papule is simply dug out by the nails, thus leaving a raw, bleeding, or oozing surface the size of a lentil. To this severe type of pruritus Besnier has given the name of "Prurits biopsiants." As a result of the excoriation pyogenetic micro-organisms readily gain entrance into the skin or are inoculated by the nails, and impetigo, furunculosis, and other forms of infective dermatitis follow. In old-standing cases of pruritus, in which the scratching has been more or less incessant, pigmentation of the skin is liable to occur from stimulation of the pigment formation in the epidermis, and the neighbouring lymphatic glands may become enlarged.

The manner in which the skin reacts to friction and scratching varies indefinitely in different individuals. In young children the skin is more easily inflamed, lacerated, and inoculated with pyogenetic cocci than in older people, whereas senile skin reacts with the greatest difficulty to local irritation, and even vigorous scratching and rubbing may leave little or no trace behind it. Certain individuals have naturally more delicate skins than others; this delicacy is either inherited or acquired as the result of illness. In addition to the more common and immediate changes due to scratching, certain more remote effects may occur which are of the nature of reactions peculiar to the individual. In some people a papulo-vesicular eruption is produced by rubbing, which tends to weep, become crusted, and to assume the characteristics of eczema; this con-

dition is known as eczematisation. In others a pruriginous eruption appears, consisting of flat or rounded itchy papules; and in a third class of individuals the peculiar type of thickening of the skin, to which the name lichenification has been applied, is called forth. The reason why scratching produces eczematisation in one case and lichenification in another is not fully understood.

The subjects of eczematisation and prurigo are discussed elsewhere (see pp. 269); that of lichenification will be described here.

LICHENIFICATION.—SYN.: *Lichénisation* (Besnier). — **Definition.** — A series of changes which occur in the skin of certain individuals when it is subjected to incessant friction from rubbing and scratching.

**Etiology.**—The etiology of lichenification is bound up with that of pruritus and has been discussed in detail under that heading (*vide* p. 278). It is most common in adult life, although there is no maximum or minimum age for it, and it occurs more frequently in women than in men. Heredity may be an important factor in its etiology by determining a nervous predisposition. A general want of tone of the nervous system is usually present, and is evident by want of power of control, irritability, and neurasthenia. There is a weakness of the nerve-control of the skin, which may be brought about by the existence of some irritable skin-affection such as eczema, by auto-intoxication from digestive derangements, by abuse of alcohol, coffee, tea, and by diseases such as diabetes. Habit has a good deal to do with the production of the patches in certain instances. In one of my cases, as a result of a slight irritation over the lower eyelid, a boy with chorea developed the habit of rubbing his lower lid till it became lichenified; in another case a lichenified patch was present on the ulnar aspect of the left forearm in a somewhat nervous man who was a timekeeper in a factory, and had to spend many hours every day leaning on a counter checking the time of the workmen. He developed a habit of rubbing the arm incessantly on the counter, which caused the lichenification. The habit may persist after the pruritus has gone and so perpetuate the lichenification. An attack of pruritus associated with rubbing and lichenification has been known to follow causes similar to those which may precede an attack of lichen planus, such as financial loss, bereavement, or mental anxiety. According to Brocq, lichenification is a special type of reaction which is produced easily in certain individuals, owing to the lowering of the vitality or the nutrition of the skin, from various causes which may be congenital or acquired.

**Histo-Pathology.**—Microscopically the principal changes consist of hyperkeratosis, proliferation of the prickle-cell layer with down-growth of the interpapillary processes, and a cellular infiltration in the papillary layer of the corium and oedema, without marked vascular dilatation. These changes indicate a process induced by external irritation rather than by a toxin circulating in the blood.

**Clinical Features.**—Brocq suggested the name lichenification for the

peculiar modification of the skin which is produced by scratching, and he has given the most detailed description of it. It consists of a thickening and loss of pliability of the skin, the surface of which, when examined by oblique light, shews the presence of numerous facets; these facets are flat and glistening, and are separated from each other by the natural lines of the skin, which are unusually well-marked. It is invariably the result of friction of some sort or other, and may be due to incessant scratching or rubbing to relieve pruritus, or to the intermittent pressure of badly-fitting corsets or a truss.

When the lichenification supervenes on an apparently healthy skin in which there are no objective symptoms it is known as "*primary lichenification*"; when, on the other hand, it is superimposed on a skin affected with eczema, seborrhoeic dermatitis, streptococcic pityriasis (Sabouraud), or other itchy condition, it is known as "*secondary lichenification.*"

According to Brocq there are two main forms of lichenification, (1) a circumscribed form in which there are patches, varying in size from a sixpence up to that of the palm of the hand, and (2) a more diffuse variety in which much of the skin may be involved. All gradations between these two main varieties may be encountered.

*Circumscribed Lichenification.*—SYN.: *Lichen circumscriptus* (of the older writers), *Lichen simplex chronicus* (Vidal); *Névrodermite chronique circonscrite* (Jacquet); (the name "Névrodermite" has been applied in France to the lesions produced in the skin by friction for the relief of pruritus; it corresponds to Brocq's "Pruritus with lichenification"); *Pruritus circonscrite avec lichénification* (Brocq).

At first no visible changes are noticeable in the skin to indicate the underlying pruritus; but, as the result of rubbing, the skin becomes somewhat darker in colour and a few flat or rounded papules may be noticed dotted over it. Soon, however, it becomes definitely thickened and a plaque is formed. This is not as a rule clearly defined like a patch of hypertrophic lichen planus, but gradually fades away into the surrounding skin. The most marked feature in the patch is its mosaic-like surface. This is caused by the deepening of the natural lines of the skin, which, crossing each other, break it up in a regular manner into numerous polygonal or lozenge-shaped flat and glistening plateaux, each about the size of a pin's head. These flat lesions are not so definitely papular as lichen planus and have neither striae nor puncta. Towards the border the plaque is slightly pigmented, whilst in the centre it is more pronounced and raised up. Brocq divides the fully-developed plaque into three zones:—(i) An external ill-defined zone, 2 to 3 inches in breadth, composed of minute pigmented papules of a *café au lait* or brownish hue. (ii) A middle zone in which the elements are polygonal or hemispherical in outline and have a shiny surface. The lesions are isolated towards the external zone and confluent towards the centre. They appear to be formed by a more marked hypertrophy than that which characterises the elements of the preceding zone. (iii) An internal or central zone, reddish in colour or like the surrounding skin, in which the tissue is

definitely infiltrated and the process of lichenification is at its height. The surface is cut up by the natural lines of the skin into rectangular or lozenge-shaped facets. The older lesions may be slightly scaly on the surface, and they are frequently excoriated from scratching. The patches vary considerably in shape, the most common form being oval, but they may be angular or irregular in outline. The affected skin preserves its sensibility to touch, heat, and cold. The lesions occur most commonly at the nape of the neck, on the thighs, antero-extensor aspect of the legs, elbows, popliteal spaces, axillae, palms and soles, scrotum or vulva. They rarely occur on the face, but I have seen them twice on the lower eyelids, and behind the auricles. They may be single or multiple and are sometimes symmetrical. The itching associated with the lesions may be continuous, but as a rule it is intermittent. It frequently comes on about an hour after going to bed. The paroxysms of itching may be so severe as to render the patient nervous of their onset, and they may be so severe at times as to amount to a veritable nervous crisis, associated with violent scratching.

The exacerbations of itching may be determined by errors of diet, exposure to cold, excitement, overheating, emotion, and various other causes dependent on individual idiosyncrasy. It is rare for the lesions to be secondarily inoculated by pyogenetic micro-organisms, but, as the result of incessant scratching, they not infrequently become eczematised, and typical papulo-vesicles of eczema may develop on and around them, followed by weeping and the formation of crusts. It has been observed also to coexist with vitiligo.

*Diffuse Lichenification.*—Syn.: *Prurit diffus avec lichénification* (Brocq).

In this type various regions are affected, such as the arms, legs, abdomen, sides of the chest, and frequently in a symmetrical manner. As a result of the general pruritus and rubbing the skin is discoloured, slightly pigmented, and dotted over with discrete flat shining macules or papules, and occasionally with acuminate follicular papules, with here and there some general thickening. Patches similar to those of the circumscribed variety may also be present in situations where the pruritus is more definitely localised.

**Diagnosis.**—The characters of lichenified skin are so obvious that no difficulty is encountered in its recognition. The only problem in connexion with the diagnosis is its distinction from lichen planus. At the outset it may be said that certain observers consider that the circumscribed patches of primary lichenification are badly marked patches of lichen planus. This is undoubtedly true in certain instances, for cases occur in which a patch of lichenification is followed by an eruption of typical papules of lichen planus, or in which a careful search will reveal the presence of the lesions of lichen planus in the neighbourhood of the patch. That there is the closest relation between the two conditions is evident in their etiology, histo-pathology, and clinical characteristics.

It seems probable, however, that primary lichenification in the form

of patches [*Lichen simplex chronicus* (Vidal), *Névrodermites*]' may occur apart from the lichen planus and the presence of planus papules. This point of view is strongly insisted upon by the French writers, Darier, Brocq, and others. Brocq maintains that the initial lesion is different from that of lichen planus, the typical lesion of lichen planus being a flat polygonal papule, frequently lilac-tinted, umbilicated, and presenting milky striae and puncta on the surface, whereas in lichenification the lesion is a macule or a less definite flat or round papule, is yellowish-pink or reddish in colour, not umbilicated, and never presents the milky puncta and striae.

Histologically the lesions differ in that the blood-capillaries are not markedly involved, and no plasma cells or other suggestion of the effects produced by toxins circulating in the blood have been detected. It seems probable then that in lichen planus the predisposition is there, in which lichenification readily occurs as a result of rubbing, but that another factor is present which determines the characteristic lesion, possibly a toxin circulating in the blood.

**Prognosis.**—With regard to the circumscribed patches the prognosis with suitable treatment is fairly satisfactory, and the patches may be removed in a month or six weeks. If left alone, however, they may persist for years. Sometimes the itching disappears more or less suddenly, the rubbing ceases, and the patch gradually fades, leaving, as a rule, a pigmented area and a few isolated papules which disappear in time. On the other hand, one or more patches may disappear, but new pruritic areas assert themselves, followed by rubbing and lichenification.

In both the circumscribed and the diffuse forms the prognosis is determined by much the same considerations as in pruritus; except that when lichenification is established a vicious circle is set up, for the thickening of the skin irritates the nerve-endings and so keeps up the pruritus, whilst the rubbing which is indulged in to relieve the pruritus increases the lichenification.

**Treatment.**—The rational treatment of lichenification has three main objects: (*a*) to remove the cause and to allay the pruritus; (*b*) to increase the power of resistance of the individual so as to reduce the general irritability and the tendency to react to scratching or rubbing in the form of lichenification; (*c*) the removal of the lichenified lesion.

*General Treatment.*—The question of the removal of the causes of pruritus has been discussed in detail. To do this successfully the "patient behind the disease" must be most carefully studied, the functions of every organ considered, and any obvious defect corrected on general medical principles. In many of the cases there is a definite nervous weakness, emotionalism, hysteria, neurasthenia, what the French call "névrosisme," which must be dealt with on ordinary common-sense lines. In other cases there is some general organic defect, such as diabetes or pulmonary disease, which demands special treatment. It occasionally happens, as in eczema, that the pruritus is associated with bronchitis or asthma, and that when the pulmonary symptoms are prominent the

pruritus is comparatively quiescent, and vice versa. Another common factor in the production of pruritus is intestinal auto-intoxication, which must be dealt with by carefully regulating the diet and by appropriate medicinal treatment.

The resisting power of the individual should be increased by tonics, such as iron, strychnine, or small doses of quinine. In some thin patients fattening substances, such as cream, olive oil, cod-liver oil and malt, and pea-nut butter, are well tolerated and beneficial.

*Local Treatment.*—The objects of the local treatment are to reduce the irritation and cause the retrogression of the lesion. The different local remedies for pruritus all have their special indications. Of these the most generally useful are lotions of carbolic acid (1 in 40); 2 per cent camphor in spirit; tar lotions, such as liq. carbonis detergens, a teaspoonful to half a pint of water; and various antipruritic creams and ointments, such as menthol 1 to 2 per cent in ung. zinci oxidi, and oil of cade ℥x. in ung. aquae rosae.

In the past various heroic operative measures have been adopted with more or less success, such as linear scarification, ironing the surface with a flat cautery at a dull-red heat, and incision of the nerves around the affected area. Such procedures have been superseded by electro-therapeutic methods. Static electricity and high-frequency effluves have been recommended; but, although they may be of some benefit, they are of much less value than the *x*-rays. The *x*-rays in suitable doses are by far the best means at present at our disposal for removing these patches. A full Sabouraud dose is given to each patch. This is followed almost immediately by a cessation of itching, and a process of retrogression occurs in the tissue, with a gradual reduction of the thickening. A single dose may remove the lesion, leaving only a pigmented stain, but if it be insufficient a second may be given in a month or six weeks. After the *x*-ray exposure no local treatment should be used. The most intractable of all the circumscribed patches are those at the nape of the neck, especially when they spread up into the occipital scalp. From scratching or the coexistence of seborrhoeic dermatitis these patches are apt to be more inflamed than those in other situations and to become eczematised. It is inadvisable to expose such patches to the *x*-rays till the inflammation or crusting has been reduced by suitable applications, such as boric compresses and mild antiseptic ointments. If the scalp be involved, the hair should be cut short over the affected area. The full dose of the *x*-rays will bring the hair out, but it will grow again in a few months. The only situation in which the *x*-rays should not be employed is the scrotum, for fear of causing atrophy of the testes and sterility. They may be used with safety at the vulva and about the anus, and by their use I have several times been able to clear up lichenified patches in these situations which had resisted other forms of treatment. Excellent results may also be obtained in these lesions by the application of radium, and this has the great advantage of being more easily applied than the *x*-rays. The great difficulty, however, is that a fairly large applicator is

required in which the radium is spread out on a flat surface, and the treatment may be prohibitive on account of its expense.

After any form of treatment, however successful, it is essential to protect the skin for some time against local irritation from air, and friction, by means of plasters, painting with zinc ichthyol gelatin (gelatin ʒii., zinc oxide ʒiii., glycerin ʒiii., ichthyol gr. x., water ʒi.), or by other occlusive methods.

J. M. H. MacLeod.

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# ECZEMA

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Eczema is the commonest of all skin diseases, but observers differ in their estimate of its frequency as they are not agreed as to the forms of dermatosis which may be legitimately included under this name. Thus, some authorities include all the vesicular forms of traumatic dermatitis,

whilst others refuse the name of eczema to all the eruptions due to the action of any known irritant.

**Historical.**—The conception of eczema as a type of cutaneous eruption began for all practical purposes with Willan and Bateman. It is clear that these writers were mainly concerned with the eczematoid eruption due to the action of external irritants; for, although Bateman stated that "this eruption is generally the effect of irritation whether internally or externally applied," he divided the disease into (1) eczema solare, due to direct sun or heated air; (2) eczema impetiginodes, seen in grocers, bricklayers, etc.; and (3) eczema rubrum, commonly due to mercury, but also to exposure to cold. Following upon these authors certain great observers of the French school, notably Alibert, Biett, and Rayer, expounded their conceptions of the disease and laid more stress on the internal or diathetic etiology. Besnier points out that Rayer first separated the artificial eruptions from cases of genuine eczema. Hebra and his pupil Kaposi next brought into prominence their views on the subject. It is, I think, a common error to believe that the Viennese school returned almost entirely to the conception of Willan and Bateman, and regarded eczema as due exclusively to the action of the external irritants; for Kaposi in his lectures divided eczemas into idiopathic or due to irritants, and symptomatic or due to abnormal constitutional states, and also insisted that eczema might occur as a purely nervous condition. But they undoubtedly laid greater stress (and in my opinion correctly) on the external than on the internal factors. Tilbury Fox contributed largely to the clearness of our conception of the forms of eruption properly included under the heading of eczema, and gave the first accurate description of impetigo contagiosa, which was henceforth removed from the category of the eczematous eruptions. He also separated the vesiculo-bullous eruption of the hands and feet now commonly known as dysidrosis or cheiropompholyx, though the propriety of this separation is not universally admitted. The next worker on the subject to bring any important new view was Unna, who definitely took up the position that eczema is a parasitic disease and described the supposed causal agent as the *Morococcus*. Unfortunately Unna departed from the classical description of the papulo-vesicle, and his work seems to refer more to superficial pustules which would not be considered as the primary lesion of eczema by most other dermatologists. Further, the chief characteristics of the *Morococcus* lay in its histological position and grouping rather than in any cultural peculiarities, and this name was probably applied both to the ordinary staphylococcus of suppuration and to the common coccus of the skin which has the peculiarity in culture that it does not digest gelatin. Unna not only laid stress on the microbic origin of eczema, but he also brought together the group of symptoms previously called pityriasis, seborrhoea capitis, seborrhoea corporis, etc., and formed from them the conception of a seborrhoeic eczema, especially insisting that the scurfy head, rings of eruption on the body, and certain circumscribed eczemas were all related and belonged to his

type of seborrhoeic eczema. Later on he extended this class, and practically stated that all eczema was seborrhoeic in origin and that psoriasis was its driest form. This new conception attracted many adherents, both in this country and on the Continent, but most were unwilling to follow Unna completely, and only a few competent observers agreed that psoriasis was a form of seborrhoeic eczema. Undoubtedly Unna's studies aroused great interest in the subject and were most valuable for their histological importance, more especially his work on the distribution of certain organisms in the tissues, such as the staphylococci and the so-called bottle bacillus. But his conclusions are no longer generally accepted, and modern work has tended more and more to separate off the seborrhoeic forms of inflammatory eruption and to place them under another group, often called the seborrhoeides or seborrhoeic dermatitis.

In 1900 Sabouraud, as the result of his masterly researches on the pyogenetic forms of dermatitis, was led to investigate afresh the question of eczema. He returned completely to Willan's idea of the primary vesicle of eczema, which he found to be non-microbic, and at the same time he brought forward a mass of evidence shewing the relation of true eczema to the streptococcic and staphylococcic inflammations of the skin which may precede or supervene upon a true eczema. Subsequently Sabouraud also investigated the seborrhoeic forms of eruption and for the first time reduced them to order. I have repeated the whole of Sabouraud's work on these subjects, and agree on every point except as regards the etiology of primary oily seborrhoea.

**Etiology.**—This want of unanimity as to what should be called eczema adds to the difficulty of giving a satisfactory account of the etiology. From the causal standpoint I certainly prefer to include all those forms of traumatic dermatitis characterised by an eruption with the clinical and anatomical features commonly attributed to eczema, more especially because the susceptibility to irritants varies so greatly in different persons. This *susceptibility* is of great interest and importance in the consideration of the etiology of eczema. Jadassohn has classified it in a very satisfactory manner, more or less after the following scheme. In addition to the powerful corrosives, such as strong mineral acids and caustic alkalis, there are many substances which, in certain strengths or when allowed to act for a certain time, irritate most skins. The strength which produces irritation in most skins may be termed the normal strength of the irritant, and the skins which react to this may be said to possess a normal susceptibility to the irritant. Some skins are very resistant, and some, probably more, react to a smaller dose. The latter may be said to possess an abnormal susceptibility to the irritant. This abnormal susceptibility may obtain with regard to one or all irritants, and in these cases the skins may be said to have a special or general susceptibility. Again, this susceptibility may be congenital or acquired, permanent or transient, and almost certainly most cases of eczema are due to an excessive susceptibility to irritants, so that in many instances slight exposure to cold winds, sunlight, heat, or friction (all of them irritants

to the normal skin) is followed by an outbreak of eczema. The familial tendency to eczema, which is often strongly marked, is probably an inherited susceptibility. Another class of substances, though hardly irritating to most skins, causes the most intense inflammation in a comparatively small number of individuals who may be said to have an idiosyncrasy to the particular substance. Idiosyncrasy is usually special, that is, it is limited to one substance only, and in some cases is extraordinarily delicate. Of course this classification is of relative value only, and occasionally doubt arises as to which class the patient belongs. Thus, in the case of the poisons of some plants, for example the American poison ivy (*Rhus toxicodendron*) and *Primula obconica*, very large numbers of persons are susceptible to comparatively small doses of the poison, whereas other individuals do not appear to be affected by these poisons even when very highly concentrated; hence if the classification be rigidly followed we must speak of a widespread idiosyncrasy, which is almost a contradiction in terms.

On the whole, it may be said that the thin, dry, and fresh-coloured skins commonly possess a somewhat high general susceptibility; whereas the thick greasy skins are more often resistant to the unorganised irritants, but, from the stagnation of secretion, are liable to those superficial infections which are usually grouped under the heading of seborrhoeic eczema.

The consideration of the innate susceptibility of the skin is far from exhausting this part of the subject. It is hardly possible to exaggerate the importance of recognising that susceptibility may be acquired. It is extremely common to find that an irritant in frequent use, which has been tolerated by the skin for long periods, eventually overcomes the resistance and sets up an eczematous dermatitis; this is well shewn by the familiar example of eczema due to antiseptics. The usual history is somewhat as follows: The patient on first handling the antiseptic suffers from a slight and transient irritation. With the continued use of the irritant the skin appears to acquire a certain degree of immunity, and no further irritation is noticed for a time. Soon, however, the exposed parts, usually the hands, begin to sweat excessively and very little later an acute eczema bursts out. This, though at first localised to the exposed parts, quickly spreads to other regions of the body, and a generalised eczema results. If the irritant be rigorously avoided, the eruption rapidly subsides under appropriate treatment and the skin apparently returns to the normal. It is not, however, in the same condition as it was before the outbreak, for the slightest contact with the irritant will cause an immediate and violent return of the symptoms, which are now less easily combated than before. So the case progresses from bad to worse, and the eruption, which at first was only evoked by a special irritant, readily appears on the slightest exposure to any deleterious agent. In some cases in which the irritant is volatile, for example formalin, even inhalation or ingestion may excite the eruption; a patient of mine was attacked in the hands soon after entering a room in which formalin

vapour was present although he wore long rubber gloves; and Wiley found that the ingestion of 100-200 milligrams of formalin mixed with milk determined after ten days an itching eczematous eruption on the chest and thighs.

This is a brief outline of the purely external causes of eczema or, as some prefer to call it, irritant dermatitis. I am convinced from numerous observations that it is hardly possible to exaggerate the importance of the external irritant in producing eczematous eruptions, and many cases which are labelled "gouty" may easily be proved to be due to an external irritant. It is clearly impossible to enumerate the irritants which may be responsible, but a few indications of the lines of inquiry may be given. These are: exposure to plants, most of which have in some instances given rise to eczema; cosmetics, including hair-dyes, tooth-washes, powders, and other local applications; chemicals used professionally or in the pursuit of a hobby, notably photographic developers, especially metol and ortol, stains and polishes for wood, bichromate of potassium, turpentine, certain powders which may be handled, such as the sawdust from various woods, especially walnut, cinchona bark in preparing drugs, sugar dust, tobacco dust, cement, and lime; dyes of clothes, or more probably impurities, such as chloride of zinc or arsenic, present in the dye; antiseptics, especially the spirituous solution of the biniodide of mercury and formalin (*vide* also pp. 85-87).

*Structural Peculiarities of the Skin.*—Ichthyosis and the slighter degree known as xerodermia are fruitful predisposing causes. The skin is lacking in one of its most important constituents, namely the grease, and consequently becomes harsh, brittle, and easily fissured, and from the fissure there frequently starts an intractable eczema. On the other hand, skins which perspire excessively are liable, in addition to the true surface infections, to an irritant dermatitis caused by the acrid products of the decomposition of the excretions. In the case of the dry skin the backs of the hands and the extensor surfaces generally are chiefly affected, leaving the flexures soft and pliable, whereas in the hyperidrotic skins it is usually the flexures of the elbows and knees and the axillae and groins which suffer.

The question of the relation of bacteria, chiefly of the pyogenetic cocci, to eczema is one of great importance and is still to some extent unsettled. From various researches on the subject it may, I think, be stated with some confidence that bacterial infection is not the direct cause of eczema; it is also clear that an abundant proliferation of pyogenetic cocci in the serous discharge of eczema has important effects on its characters. Bockhart, Bender, and Gerlach found that the inoculation of staphylococci apart from their metabolic products produced pustulation and not eczema, but that the inoculation of staphylococci with their metabolic products or of the products alone determined an eczema; in other words, that the chemical irritation of the skin by the toxins was a necessary factor in the production of an eczematous eruption. If, then, a weeping eczema becomes extensively infected, the conditions are soon

fulfilled and the eczema is kept up and aggravated; or in the presence of an infective discharge, for example from the nose, ear, or vagina, flowing over hitherto sound skin it may be expected, as in fact commonly occurs, that an infective eczematous eruption will result. Sabouraud, as the result of his extensive researches on the subject, has taken up a definite position on this question, and considers that many of the eruptions commonly called eczema, such as the circinate dermatitis behind the ear with fissuring of the post-auricular fold, are in reality chronic streptococcic eruptions or impetigo. The chronic weeping and thickening of the epidermis in eczema are also due to the action of streptococci, whereas the pustules scattered over the same area are the result of staphylococcic infection. These views are extremely difficult to substantiate or refute as it is very hard to estimate the degree of the streptococcic infection in the presence of a concomitant and abundant staphylococcic invasion; but it may safely be concluded that all eczemas presenting chronic weeping and epithelial proliferation are largely the result of pyogenetic infection.

In considering the internal diseases which stand in etiological relation to eczema we are at once met by the difficult question of the so-called *gouty eczema*. There is no doubt that the lay public and, to some extent, the general medical profession consider the connexion between gout and eczema to be very close. Sir Alfred Garrod drew attention to this relationship, and stated that eczema was extremely common in gouty patients. The difficulty of the subject is largely due to the loose manner in which the title gout is used, for it is often applied to conditions which are in all probability various forms of toxaemia. If all these are regarded as "gout," then certainly eczema is often gouty in origin; but, on the other hand, a more careful analysis of symptoms shews that the relationship between true gout and eczema is less intimate. No doubt the subjects of tophaceous or arthritic gout are particularly prone to suffer from eczema, just as they are to be attacked by catarrh of the alimentary and respiratory tracts, but as we do not at once assume that a bronchitis is of gouty origin it does not seem logical to attribute eczema to this cause in the absence of corroborative symptoms.

A peculiar association is often noticed between *asthma* and eczema. In this case the patient often suffers from eczema in earliest infancy. The asthma occurs later in life and often alternates with the eczema for a time until, with advancing age, the patient becomes subject to both at once and is scarcely ever free. This is the most intractable type of the disease.

Probably the commonest of the internal factors in the production of eczema is some form of *gastro-intestinal toxaemia*. In some patients certain articles of diet regularly call forth an irritable eczematous eruption, and I know one patient in whom the very smallest amount of oatmeal constantly produces an outbreak. In others acid fruit, and especially the rather acid white wines, may determine the eruption. In my experience the starchy and saccharine foods are more frequently responsible than

the animal parts of the diet, though in some cases a high meat-diet is followed by the eruption.

The relation of *renal disease* to eczema has been much discussed, and whereas some maintain that abnormal urine is a frequent concomitant of eczema, others have pointed out that it is comparatively rare to find any gross change in the urine, such as glycosuria or albuminuria, in association with the eruption. With the latter view I agree, but the examination of a short series of cases seemed to shew that some deficiency in the power of excretion of salt was fairly frequent in the chronic exfoliative forms. *Glycosuria* and *diabetes* appear to act in two ways; (*a*) much more commonly the sugar-containing urine exerts a direct irritating effect on the skin, and this is so frequent that it is important to examine the urine for sugar in all cases of vulvar or preputial eczema. (*b*) More rarely the constitutional effect of diabetes produces a general eczema, usually of the infective type.

*Anaemia* is also regarded by many as a cause of eczema, but in my experience it tends rather to make the eruption chronic and indolent than actually to initiate it.

The *nervous system* certainly has a great influence as a disposing if not as an exciting cause. I have often noted that shock and more especially worry and what may be called nervous tension have either caused an exacerbation of an existing eczema or even determined the original outbreak of the disease. Possibly the action may be indirect and through the medium of the digestion, as it is well known that worry is particularly harmful in this respect, but I have certainly seen outbreaks caused by worry in patients who had not presented any symptoms of dyspepsia.

Apart from these general causes of eczema there are a number of *local causes* other than external irritants. The first and most important of these is undoubtedly a feeble circulation. The classical example of this is the so-called varicose eczema, which is usually a chronic infective form due to slight and repeated trauma, either accidental or the result of itching and frequent scratching of the slightly oedematous skin. It is, however, quite common to find eczema of the lower extremity without marked varix, and it is certain that patches of eczema are far more frequent on the leg below the knee than elsewhere. Eczema is somewhat frequently caused by the pressure and friction produced by sitting with the legs crossed. The common positions for this form are over the outer head of the gastrocnemius in those who cross their knees, and just above the external malleolus in those who cross one ankle over the other knee. Both forms appear to begin with a chronic folliculitis.

**Morbid Anatomy and Pathology.**—As might be expected in such a protean disease, the morbid anatomy of eczema varies greatly, but certain points are common to all forms. These are (1) dilatation of the papillary vessels, (2) oedema of the papillary body and epidermis, (3) abnormal processes of cornification. The oedema of the papillary body and the epidermis is now often spoken of as "spongiosis." The oedema of the

epidermis begins by the over-filling of the intercellular canals with stretching and possibly rupture of the inter-epithelial fibrillae or "prickles" (see Fig. 64). When this process becomes well developed there results a cavity filled with serum, which if small and deep gives the sensation of a solid to the finger and is often called a papule, whereas if it becomes superficial it can be identified as a vesicle. In some cases many vesicles may run together and form a bulla, but the net-like

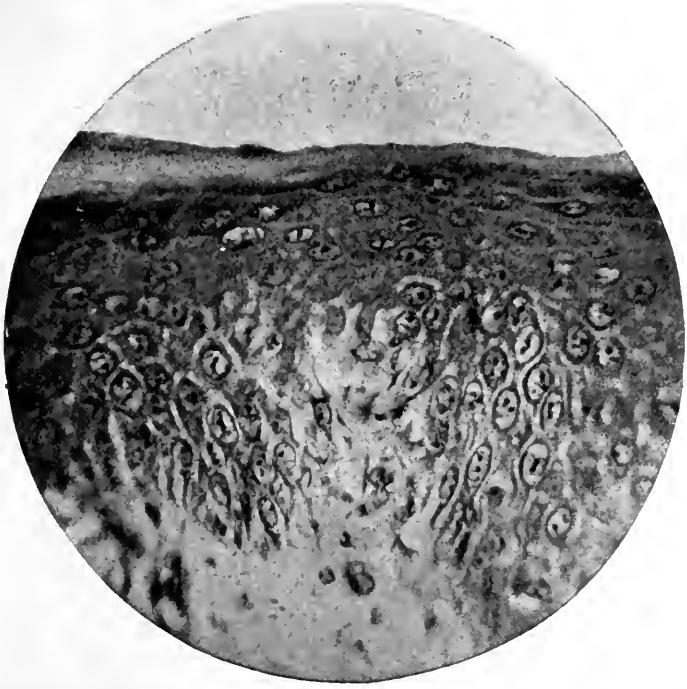

FIG. 64.—Commencing vesicle of acute eczema; inter-epithelial oedema over the apex of the papilla.

markings on the surface of such a bulla indicate that it is formed by the confluence of many small vesicles (Fig. 65). Later on the excess of fluid becomes imbibed by the body of the epithelial cell, which becomes distended and takes the stain less firmly, appearing pale and dropsical under the microscope.

The abnormal cornification is now generally known by Auspitz's term of parakeratosis. Before describing it, it may be well to recall the normal sequence of events. Starting with the living cell of the stratum mucosum, there is first a gradual flattening of the cell as it rises towards the surface, accompanied by a progressive diminution in the basophilia of the nucleus and a disappearance of the intracellular fibrillae. At a certain level the nucleus has ceased entirely to be basophilic and

the intracellular fibrillae have disappeared, their place being taken by small irregular granules which have been ascribed by some to the disintegration of the fibrillae, and by others to the chromatin of the nucleus. This is the so-called stratum granulosum, and it is probable that the death of the cell takes place here, though a series of chemical changes is continued up to the surface. These changes consist mainly in the formation of keratin in the outer part of the cell, while the inner part becomes converted into fat. At the same time the cell becomes greatly flattened and

FIG. 65.—Acute eczema; to shew the multilocular character of the bullae.

all trace of its nucleus is lost. This constitutes the horny layer of the epidermis, and forms the protective covering of the skin.

In the eczematous condition the series of changes outlined above is incompletely carried out. The stratum granulosum is irregularly formed or is not produced at all, while in the upper layers the nucleus and protoplasm persist so that, although the keratin envelope is formed to a certain extent, it encloses a moist and almost grease-free protoplasm. On reaching the surface evaporation of water takes place through the keratin coating, resulting in shrinkage and distortion of the cell and formation of scales. If the process of eczematous inflammation is prolonged, there results in a variable degree an overgrowth of the epithelial cells, producing

a thickening of the epidermis (acanthosis). As a rule, this epithelial proliferation causes a great increase in the depth of the epidermis between the papillae with a resultant increase in the height of the papillae, the apices of which may be covered with even less epidermis than normal, but in some chronic varieties actual papillomatous overgrowth may occur. In addition to this the small vessels of the corium shew a prominent proliferation of the adventitial cells so that they stand out in microscopic sections as broad bands. Probably also a certain amount of new fibrous tissue is formed, though how much it is difficult to estimate; at all events the connective-tissue cells of the corium are much more numerous than normal.

The changes above enumerated take place even in the absence of bacterial infection, and all discharging eczemas shew the added signs of infection in the shape of a marked polymorphonuclear leucocytosis. This leucocytosis is first seen when the vesicle has either ruptured or has persisted long enough for the contents to be contaminated. The papillary body then becomes crowded with leucocytes which may also be seen wandering between the epithelial cells and accumulating at the surface in the exuded serum to form a crust.

The **symptoms** of eczema vary according to the intensity of the process, the innate peculiarities of the part, and the amount of superadded pyogenetic infection.

The epithets acute, subacute, and chronic as applied to the disease have been used in different senses by different observers, and some confusion has therefore arisen. Thus, some authors have used these terms in relation to the duration of the attack, and others have applied them rather to the intensity of the process. In this article the terms are used in the sense of the rapidity of onset and duration of the attack.

*Acute eczema* is most often the result of external trauma acting almost alone, and to such an extent is this true that some authors, wishing to separate the results of pure traumatic inflammation of the skin from cases in which an internal factor is present, have abandoned the use of the term acute eczema in favour of acute traumatic dermatitis. As already stated, I do not agree with this view, and shall therefore describe the eruption under the older name. The attack consists of several stages, but it may not pass through them all, the process being arrested and involution taking place before the next stage is reached. On the other hand, in some cases the attack does not clear up entirely, but runs on into a chronic eczema, or, more frequently, part of the eruption may disappear completely while other parts become chronic. The earliest stage is marked by the rapid appearance of redness with some swelling and a complete arrest of the sweat function in the affected part. In regions where the skin is thick and adherent, such as the palms of the hands, the redness and swelling are not well marked; in other parts where the skin is loose and delicate, such as the scrotum, eyelids, and ears, the swelling is often so great as to cause a certain degree of translucency, and may give rise to an appearance strongly suggesting nephritis. Unless

the attack passes off without developing further, in which case it is followed only by a branny desquamation, papules and vesicles rapidly make their appearance. These acutely forming papules are in reality localised collections of fluid deep in the epidermis, and are microscopically evident as multilocular vesicles (see Fig. 64). On the face and scrotum, therefore, they are not usually seen, as the epidermis is thin and the fluid quickly reaches the surface and gives rise to an obvious vesicle. The papule and the vesicle of acute eczema have one very important clinical characteristic, namely that they never enlarge beyond a very limited extent, and this is regarded by some of the best authorities as a diagnostic point from certain other vesicular diseases. The size of the papule and vesicle is about that of a millet seed, and although large areas of raised skin and bullae are frequently formed, these are due to the confluence of papules or vesicles respectively, and in the case of the latter the markings of the original vesicles may be seen on the surface of the bullae (Fig. 65). After a variable time these vesicles burst and leave a red weeping surface, the discharge from which is acrid and coagulable, and dries to form a tough transparent yellow crust, or if soaked up by linen causes stiffening of it. While the process remains at its height little scab-formation occurs and little pus is produced, but later, when the discharge of serum is abating, crusting becomes a prominent feature, and beneath these crusts a certain amount of purulent fluid accumulates. Apparently the rapidly flowing serum is bactericidal or, at least, markedly inhibitory to the growth of organisms, but when the serum stagnates this property is lost. In regions such as the palms of the hands and sides of the fingers, where the horny layer is thick, the vesicles may persist for some time without rupturing externally, and many vesicles may run together to form bullae. In such cases the fluid remains clear for a few days, and gradually becomes opalescent from the accumulation of leucocytes consequent upon pyogenetic contamination. With the onset of the discharge the oedema previously present generally subsides, and a free flow of serum persists for a variable number of days, after which there is a gradual diminution of the weeping, and the raw surface becomes covered with golden-yellow crusts. Usually within a few days of the cessation of the discharge the crusts fall off and expose a pink, thin, and slightly scaling surface, which soon returns to the normal in appearance. It is worthy of note, however, that this apparently normal skin is left with a high susceptibility to irritants, and that a fresh attack may be easily induced by any slight irritation of the skin. This acute eczema is most commonly seen on the face and ears, the hands and forearms, and the scrotum, though it may, of course, occur in other parts such as the thighs and trunk. The whole attack usually lasts from ten days to six weeks, the average duration being about three weeks. Itching is generally intense, and pain and burning are frequently present. The temperature is not, as a rule, raised, and the constitutional symptoms are slight and confined to those occasioned by the discomfort and want of sleep.

*Subacute Eczema.*—This type is really more of a series of slight acute attacks occurring in succession in various parts of the body. It is most commonly seen on the limbs and neck. The redness or erythematous stage is often almost entirely absent, the papules and vesicles cropping up in small groups upon apparently normal skin. Discharge is not, as a rule, a prominent feature, the vesicles drying up into minute discrete crusts with a certain amount of desquamation around them. In some cases, however, there is a pronounced and almost urticarial oedema in patches, and the ruptured vesicles lie on a deep-red cushion-like base. This form seems to be specially prone to relapse after some improvement has taken place. The raw surface produces a thin, papery, and unhealthy horny layer, but the oedema does not subside entirely and the skin remains of a dusky bluish-red colour and boggy consistency. After a few days new vesicles form and rapidly burst through the ill-formed horny layer, and the whole process is repeated again and again. Before long the resistance of the tissues becomes greatly reduced, and the pyogenetic cocci, which were unable to play a very important part in the earlier stages, gain an ever-increasing hold on the tissues, and the disease acquires the characteristics of a chronic suppurative dermatitis rather than those of a typical eczema. It is hardly surprising, therefore, that in this kind of case it is specially common for the attacks to be complicated later on with generalised furunculosis, which is, of course, a well-known sequel to widespread relapsing vesicular eczema.

*Chronic Eczema.*—This is the most difficult type of eczematous eruption to describe, as many forms of eruption, probably of widely different nature, have been grouped together under this name. Although it is highly desirable that this heterogeneous collection should be classified and reduced to order, our knowledge of the real nature of the eruptions is probably too scanty to allow of its being done satisfactorily. Nevertheless, I think that enough work has been done to justify a provisional classification on the following lines.

(*a*) Chronic Traumatic Eczema.—In this form the salient features are disturbance of the cornification with resultant scaling and an instability of the vasomotor system of the affected part leading to easily provoked hyperaemia and oedema. A good instance of this type is seen in the dry scurfy patches so common on the faces of children, an eruption to which the names dry eczema, seborrhoea sicca, epidemic dermatitis of children, and *dartre volante* have been given. That the process is independent of the true pityriasis of the head, which is the fundamental change of the so-called seborrhoeic eczema, was proved many years ago by Dr. Colcott Fox, who pointed out that it was comparatively rare in combination with scurfy head. Sabouraud has drawn attention to the frequency with which it is associated with chronic infective (streptococcic) fissures at the angles of mouth or the alae nasi, and believes it to be a chronic dry form of impetigo. On the basis of my work, repeated after the publication of Sabouraud's views, I cannot, however, accept this explanation.

The eruption appears commonly round the mouth as a sheet with a more or less defined and circular outline, and it is also extremely common in the form of scurfy yellowish-pink discs scattered over the face. The divergence in colour from that of the normal skin is so slight that it is the round scurfy patch which attracts the attention of the parents, who often mistake it for ringworm. The scales are irregular in shape on parts like the forehead where movement of the skin is slight, but round the mouth, on parts of the cheek, and on the chin they are more or less lanceolate in shape. They are very adherent, and on attempting to remove them the patch reddens up and not infrequently slight bleeding results. It is often stated that the patches are easily curable, but this I regard as a mistake, for the patches become less conspicuous when covered with ointment and are by no means readily cured. The association with the nasal fissure is certainly frequent, but this I believe to be due to a common cause. Many of these children suffer from adenoids and dribble on their pillows at night, and the constant maceration of the skin round the mouth and on the chin is one of the commonest causes of the eruption. Other children suck their thumbs and so produce the maceration. In others again the use of rather caustic soaps seems to be responsible for the eruption, which is much more frequent during periods of bleak weather.

Another form of chronic traumatic eczema is commonly seen on the outer sides of the legs just above the external malleolus. I am in the habit of calling it "cross-legged" eczema as it is particularly common in men who sit habitually with one ankle crossed over the other knee; I have seen a patient who became free from it on the left ankle and developed it on the right on changing the foot which he crossed. This form of the disease appears to begin with the wearing off of the hair and the irritation of the mouths of the follicles, which become slightly hyperkeratotic. Gradually the chronic inflammation spreads so as to produce a slightly thickened, scaly, brownish-yellow patch. Occasionally there is intense itching, which lasts for ten minutes or so and then entirely disappears. If, as usually occurs, the patch is vigorously rubbed during the period of itching, oedema is rapidly produced which, beginning with the follicles and giving rise to papules, soon affects the whole area and leads to a sort of urticarial patch. If the rubbing be continued the scales are detached and a very slight serous exudation occurs. This form of dermatitis is probably identical with one type of the disease called by the French authors "Lichen simplex chronicus."

A third type of chronic traumatic eczema is that commonly seen on the hands and especially the fingers of those whose occupation brings them into continual contact with irritants of low intensity. In this form there is slight redness, but the main feature of the eruption is the overgrowth of the epidermis (acanthosis), which becomes so much thickened that the normal fine wrinkles disappear and their place is taken by coarse, deep folds. The skin is much stiffened and the

keratinisation does not occur quite normally, a certain degree of parakeratosis being present. This leads to some indolent scaling and not infrequently to the formation of deep fissures, which pass through the epidermis into the papillary layer and cause slight bleeding (Fig. 66). A fissure once formed acts as a constant irritant, and as a result the edges become hyperkeratotic and interfere with healing. In this form of eczema the nails are often affected and shew irregularity of growth, transverse grooving, and circular pitting of the nail plate (*vide* Fig. 163).

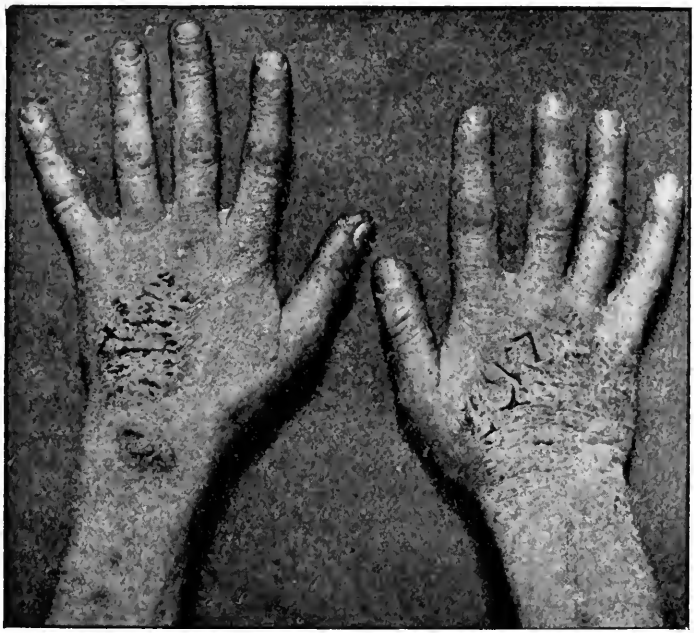

FIG. 66.—Chronic traumatic eczema with deep fissures.

A special form of traumatic eczema is that which appears as rather oedematous scattered papules associated with the most terrible pruritus. It is a little doubtful if this is in reality a primary eczema at all. It occurs in all parts of the body with the exception perhaps of the palms and soles. Attacks of itching come on and are so severe that the patient tears himself to pieces, loses his sleep, and acquires a harassed and miserable expression. The disease comes on rather gradually, the onset being seldom seen. The skin is reddened, harsh, dry, and thickened from the epidermic overgrowth induced by the continuous scratching. The creases on the forehead and round the eyes become deepened, and the folds round the wrists and at the knuckles become so deep, and the skin between so stiff, that movement is restricted. Vesicles are seldom seen, as they are ruptured at once, and, indeed, the tops of the

papules are scratched off before sufficient fluid has collected to form a clinically evident vesicle.

(*b*) Chronic Infective Eczema.—It is probable that all the so-called seborrhoeic forms of eczema should be grouped under this heading. Some seborrhoeic forms of dermatitis are not eczematous at all, that is, their clinical characteristics and microscopical appearances do not correspond with what is generally recognised as the special feature of eczema. Others do so correspond, and accordingly by some authorities are said to have become eczematised. Certainly the chronic irritation of these inflammatory infections of the epidermis, which are usually, though in my opinion erroneously, termed seborrhoea, sets up a condition which is characteristically eczematous, and which, moreover, spreads to regions such as the palms and soles, where seborrhoea does not occur.

The special features of the infective eczemas are (i) a well-marked tendency towards the production of a well-defined, circular outline to the patch; (ii) a low intensity of inflammation, so that the discharge is slight and the crusting is great; (iii) a special tendency to the formation of pustules as distinguished from the mere accumulation of pus under scabs. The most classical example of this form of eczema may be found in what is known as varicose eczema. The earliest evidence of this eruption is probably papillary congestion combined with itching. Before the surface becomes disturbed it can often be seen that the skin has become finely stippled with a brown discoloration which is evidently due to the diapedesis and destruction of red corpuscles around the capillaries of the papillae. As a result of this stasis the skin becomes badly nourished and itching is induced. Then either the scratching and rubbing by the patient or an accidental injury, such as the grazing of the surface, allows the entrance of the ubiquitous pyogenetic cocci, to which the damaged skin can offer but a feeble resistance. The part then becomes still further congested, a marked cutaneous and sometimes also subcutaneous oedema is set up, the horny layer is stripped up and not properly reproduced, and the whole of the well-known symptoms of the so-called varicose eczema ensue. The eruption is then either found on a swollen or, if the process has existed for a long time, possibly a sclerotically contracted leg. The area occupied is generally deeply discoloured and is of a dark-brown hue, and the skin not actually involved in the inflammatory process is glossy from oedema and malnutrition. The patch itself may be entirely denuded of the horny layer and exuding, when it is of a dark-red colour, or may be covered with thin, rice-paper-like scales of large size (Fig. 67). When stripped off, these scales come away easily and leave a slowly-exuding surface beneath (eczema rubrum of Hebra). The spreading edge of the patch generally shews a more active process and crusting is greater, and beyond the edge may usually be seen inflamed and angry-looking hair follicles with, not infrequently, some follicular pustules.

In other types of infective eczema the disease seems to be more constitutional and less local in origin. The subjects of the disease

appear to be congenitally susceptible to attack by the pyogenetic cocci, and it is to the forms thus produced that the names "scrofulous" and "tuberculous" eczema have been applied. The tendency to the eruption may be noticed soon after birth, at puberty, or later. The patient frequently suffers from folliculitis of the eyebrows, and especially of the eyelashes, so that styes are common. Fissures form readily at the angles of the alae nasi and behind the ears, and in adult life eczematous conditions of the moustache and beard running on to sycosis are common. At the same time there is often a pronounced tendency to the occurrence of an infective dermatitis of the axillae and groins and of the bends of the elbows and the backs of the knees (Fig. 68). Adenitis of an indolent kind is frequent, and not uncommonly some of the inflamed glands suppurate, so that in adult life scars are often seen in the neck. Children affected in this way seem to be specially prone to be attacked by the pediculus capitis, and when so attacked develop severe impetigo.

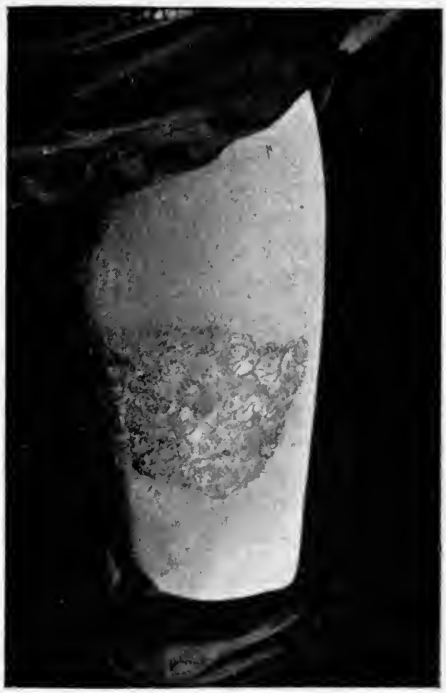

FIG. 67.—Chronic infective (varicose) eczema.

In reality it is doubtful if any of these symptoms should be regarded as truly eczematous, as the skin condition differs considerably from the classical description of eczema and is evidently closely related to the more chronic forms of impetigo. The fissuring dermatitis of the ears, angles of mouth, and alae nasi has been ascribed by Sabouraud to chronic streptococcic infection, but the infection is certainly mixed, and it is difficult to prove how far the streptococcus is the prime cause of the disease. That these patients are somewhat prone to tuberculosis is certain, but I do not think that the condition is tuberculous in origin. The truth seems to be that they are particularly susceptible to invasions by the common pyogenetic cocci, and that the chronic adenitis from which they suffer renders them specially liable to infection with the tubercle bacillus on the first available opportunity. This form has also been termed seborrhoeic eczema, but the meaning of the term has been so greatly extended since Unna first described it that it is difficult to say what forms of eczema other than the obviously acute traumatic variety are not included under the name.

In addition to these two types of infective eczema there is another group, the chief characteristic of which is the extreme mildness of the eruption. There are very numerous cases of slight eruptions, most commonly seated on the extensor surfaces of the forearms and legs, but attacking also to some extent the whole body, in which the eruption takes the form of small indistinct patches of broken horny layer varying in size from half an inch to two inches or even more in diameter. The skin is slightly reddened and the surface is roughened with the cracking of the horny layer, but the eruption can hardly be called scaly. In between the cracks in the horny layer the redness is more marked, and sometimes there is the slightest haemorrhage, so that very thin scabs of blood may appear. The whole appearance strongly resembles a "chapped"

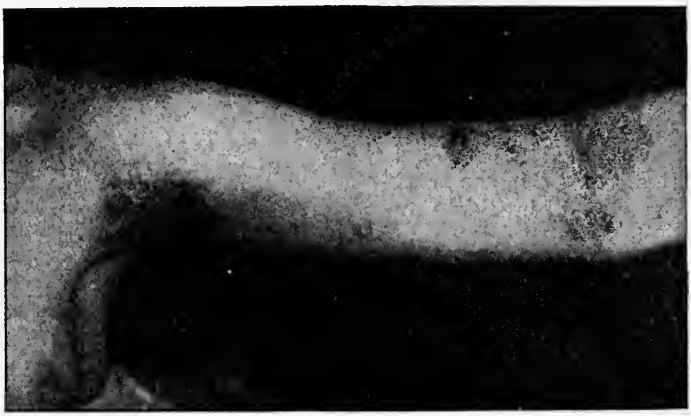

FIG. 68.—Chronic infective eczema of the flexures.

condition of the skin, but that it is not merely this is proved by its appearance in quite warm and mild weather and on parts that are protected. The skins subject to this eruption are usually of the fine dry variety and quite free from any true seborrhoeic tendency, though here again the eruption is often classed as a seborrhoeic eczema. I have examined the dry scales from these patches, and have found that they generally shew an infection of staphylococci, which on culture prove to belong to the pyogenes albus type. Whether the eruption should be regarded as a very mild primary staphylococcic infection or a secondary invasion of the damaged skin I do not know, but it usually disappears under a protective ointment containing sufficient antiseptic to inhibit bacterial growth.

Lastly we may consider the group of symptoms which were originally classed together by Unna under the heading "seborrhoeic eczema." In this type a scurfy head is almost invariably present, from which, indeed, Unna derives the whole disease. This scurfy head may be either dry or greasy, and in the former case the term "seborrhoeic" is evidently

a misnomer due to the erroneous conception, formerly widely spread, that there was a "seborrhoea sicca" in contradistinction to "seborrhoea oleosa." This "seborrhoea sicca" is now known to be a superficial exfoliative disturbance of the epidermis of mild type, or an "épidermite" according to the French authors. In its most exquisite form it is seen on the heads of young infants whose attendant (mother or nurse) suffers from the same disease. It begins usually on the vertex as a small disc, which rapidly spreads out to form a ring and closely simulates microsporon ringworm but does not cause breaking of the hair and, of course, does not shew any ringworm under the microscope. When once it has begun to spread it quickly involves the whole scalp, and often extends down on to the forehead and then generalises on the trunk and limbs. In some cases this is followed by a moderately severe cutaneous reaction of eczematous type, whilst in others it produces little scurfy patches, chiefly on the trunk and with especial affection of the follicles, which stand up erect and in many cases grow into minute horns or spines. This tendency to horn formation in so-called seborrhoeic eruptions is especially common in young children, and comparatively rare in adults. In the adult, when true sebaceous secretion is established a really dry scurfy head is not common, though this does occur. Most of the patients who complain of dryness of the head will be found to have greasy scalps, but the hair, being badly nourished and having lost its polish, is harsh and dry to the touch. The scurfiness has lost its circular outline in adult life and become scattered over the scalp, being more marked in some places than in others. This is very similar to the distribution of the microsporon ringworm in long-standing cases in which the original ring arrangement is commonly lost. An examination of the scales in the infant at this stage will shew a mixture in various proportions of the bottle bacillus and a staphylococcus, whereas in the adult the micro-bacillus is often added. In the very recent cases the bottle bacillus may be almost the only organism seen, and it is probable that this is the prime cause of the affection. The staphylococcus is, however, generally soon added, and increases the inflammatory reaction, so that minute blocks of dried serum are added to the scales. In many cases the irritation, especially in babies, is severe enough to set up an eczema of low intensity which may generalise all over the body.

In many cases in adults there may be a general true seborrhoea of the trunk with very greasy skin, and this is especially seen among those who wear heavy woollen materials next the skin. In these cases the inflammatory complications which are grafted on the seborrhoea may follow one of two types. Either a large number of the follicles may be attacked in a discrete manner so that the eruption takes the form of thickly scattered discrete papules chiefly on the shoulders, back, and chest, or a single papule may heal and become surrounded by a ring of new ones, the process being repeated until a figurate eruption is produced with a distinct red margin and a greasy, discoloured, but inactive

centre (Fig. 69). This form has been called seborrhoea corporis, circinaria, lichen circumscriptus, and eczema petaloides. It is usually situated mainly over the sternum and interscapular region, from which it spreads over the trunk generally. Histologically it appears to be a mixed infection of the bottle bacillus and the special staphylococcus (*vide* p. 6), of which the former probably determines the ringed and figurate arrangements, the latter the folliculitis; in addition, there is probably a third and unknown factor.

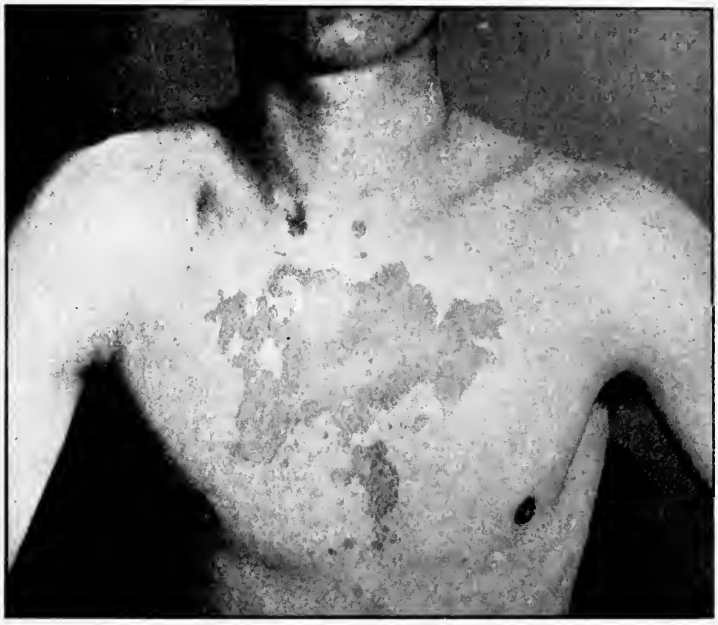

FIG. 69.—Figurate seborrhoeic eczema of the chest.

Allied to this form of eruption in etiology, but differing from it to some degree clinically, is the extremely dry form of seborrhoeic eczema which resembles psoriasis. In this form the crusting and scaling are heavy and, combined with the circinate spread, certainly give rise to an appearance not unlike that of psoriasis. Careful examination, however, will generally reveal some exudation beneath the crusts, and it can almost always be shewn by observation of the surrounding and other parts of the skin that the disease begins by the aggregation of follicular papules.

*Eczema of Infants.*—This can certainly be divided into two main types; (*a*) that which starts in the scalp as a pityriasis and spreads down over the forehead to the face, neck, and trunk, and which may be conveniently known at present as the seborrhoeic type; and (*b*) that which starts on the cheeks and chin, and is merely traumatic. The former follows the rule of the parasitic eczemas in being of low intensity and

tending to the formation of crusts rather than profuse discharge, whereas the latter lays the whole of the stratum mucosum bare and weeps abundantly. In the seborrhoeic form fine papular rashes often appear on the body, as has been already mentioned, whereas in the traumatic form the parts of the skin of the nates and thighs in contact with the diaper are often red and inflamed and the depths of the creases in the skin are clear.

**Complications and Sequels.**—The chief complication of eczema is severe pyogenetic infection. Quite commonly a patient with widespread eczema, not necessarily of parasitic origin, becomes the subject of a more or less generalised furunculosis towards the end of the attack. Widespread eczema in children has in some cases been followed by death from pneumonia and septicaemia. The dread of "driving it in" is probably partly due to this complication, and there may have been something in this notion when patients were covered with waterproof ointments which were not antiseptic. These may have simply collected the pus and poisoned the patient, though in such cases it is, of course, fallacious to speak of driving it in, since the eruption did not disappear as the result of treatment. The other cause of the "driving in" notion is probably that during any very severe illness eczema usually disappears temporarily, most likely as a result of the reduced excitability of the skin. Similarly, when the patient recovers and the eczema reasserts itself, the recovery is put down to the bursting out of the eczema, though it has preceded the outburst.

Another and, fortunately, a rare complication is the gradual transformation of the eczematous eruption into dermatitis exfoliativa, an event which is very likely to be produced by the incautious application of strongly stimulating applications.

In some cases the terrible pruritus from which patients suffer may cause great loss of weight, melancholia, and suicidal mania, but these are really direct results rather than complications.

The **diagnosis** of eczema will be dealt with according to its various stages.

(a) *The Erythematous and Oedematous Stage.*—This stage is only met with in full development in the acute traumatic form. It is not infrequently mistaken for erysipelas, but the error should not occur. The edge is diffuse and not infiltrated, and there is no great rise of temperature (possibly 99° or 100° F.), and a side light will often shew the commencing formation of miliary papules.

(b) *The Papular Stage.* — Sometimes when the papules are very oedematous there may be difficulty in distinguishing them from those of erythema papulatum. The papules are, however, smaller and softer, and do not shew the tendency to flatten in the centre and spread at the edges which is such a characteristic feature of the erythema multiforme group.

In the more chronic forms the diagnosis from lichen planus may be very difficult, especially when the eczema papules are flattening down. The points to which attention should be paid are: the arrangement,

which is in more or less circular patches in eczema and in lace-like patterns and streaks in lichen; the surface of the papule, which, while flat, is generally glazed from serous exudation in eczema and dry in lichen, also in lichen the fine white streaks can generally be found if looked for; lastly the localisation on the buccal mucous membrane when present is diagnostic of lichen planus.

(c) *The vesicular stage* may be confused with herpes and with dermatitis herpetiformis. The vesicles are larger and have thicker walls in these two diseases than in eczema; in herpes the patches come out at certain points, and in dermatitis herpetiformis the vesicles are set round the edge of an erythematous patch and bullae are often present.

In ringworm of the toes and fingers, as Sabouraud and I (23) have pointed out, the eruption may resemble ordinary vesicular eczema. Further experience has shewn that it is of frequent occurrence, and microscopic investigation is the only means of diagnosis of which I am aware.

Lastly there comes the question of the diagnosis between dysidrosis or cheiropompholyx and eczema of the hands and feet. Holding, as I do, that there is no ground to separate the two eruptions, I cannot give any differential diagnosis, but can only say that I have seen a case diagnosed as acute eczema and as dysidrosis, in which I found the ringworm fungus microscopically.

(d) *The Squamous and Crusted Stage.*—This is the stage in which the confusion with psoriasis occurs. It is rare to find a case of eczema in which removal of the scales leaves the dry, red, and punctiform base which easily bleeds, but it may occur. Careful examination usually shews that in eczema the patch is formed by the *aggregation of miliary papules*, whereas in psoriasis the patch is formed by the *essential centrifugal enlargement of a papule*. Lastly, stained specimens shew the invariable presence of groups of staphylococci and generally also bottle bacilli in eczema, whereas in psoriasis no organisms are to be seen.

**Prognosis.**—In all eczemas, but especially in the acute form, two questions arise, namely the prognosis for the particular attack and that for the future generally.

In acute eczema the prognosis for the particular attack is always good, provided that steps are taken to prevent any part of the eruption from becoming chronic.

In chronic eczema the prognosis varies greatly. In those forms which are associated with congenital abnormality of the skin, such as ichthyosis, and in that which is associated with asthma, the outlook is essentially bad, though I have seen cases in which there has been no relapse for many years.

Infective forms should be entirely curable if the patient is in a position to carry out treatment and take the necessary precautions against relapse. Chronic traumatic forms are mostly curable, but in many it is almost impossible to maintain the improvement unless the patient is perpetually protected from the ordinary wear and tear. The outlook is obviously worse where there is a strong family history of the disease.

**Treatment.**—It has been well said that successful treatment of eczema is the most searching test of a good physician. To attain this success entails the most careful examination of the whole of the patient's habit of life and his general health. In acute eczema the disease generally dies away by itself, and the physician directs his efforts to the prevention of another outbreak; but in chronic eczema the individual attack may prove extremely rebellious.

(a) *General Treatment.*—The first question to be decided is how far the constitutional condition is responsible for the eruption, and how far extrinsic factors are concerned in its causation. In order to arrive at the truth it may be, and often is, necessary to examine every system with the utmost thoroughness. Even the local irritant may escape detection unless the observer is very alert. Thus, in one case of eczema of the scrotum without any implication of the anal region the whole eruption cleared up after it was found that the patient, an adult, was suffering from oxyuris. It is often necessary, therefore, to inquire into every moment of a patient's life, and even then the necessary clue is often acquired only by accident at the end of a long interview; only too frequently the information is never obtained. It is so obvious that any defect of health should be treated at once that further details on this subject are unnecessary here. There are, however, broad principles which are often useful even when the cause of the attack has eluded detection.

Diet.—In severe outbreaks in moderately robust patients it will generally be found that a diet restricted to milk alone or with a few plain biscuits has a very beneficial effect in reducing the severity. It must be clearly understood that this is not to be indefinitely prolonged, and I think a fortnight is usually the most useful duration. I consider this a modified starvation-diet and that it acts simply by reducing the irritability of the skin, possibly somewhat in the same way as an attack of acute illness operates in clearing the skin. As a general rule the best prophylactic diet is one of extreme moderation, without any alcohol and with only small amounts of sugar and vegetable acids. In my experience meat, unless in large quantities, is not deleterious in most cases, though I have seen patients in whom beef and veal undoubtedly acted prejudicially. The popular view that a highly salted diet is bad is probably correct in cases in which the kidneys are unable to eliminate salt very freely, and consequently retention of chlorides in the tissues and oedema result.

Clothing.—In all cases, and more especially the seborrhoeic forms, no wool should touch the skin, but a ventilating cotton garment should be worn beneath any woollen clothes.

Washing.—Here we have distinct differences according to the type of the disease. Seborrhoeic patients should take extreme care to keep the skin free from stagnating and decomposing secretions, and, unless the eczema happens to be severe at the time, plenty of bathing with soap and even sea-bathing are often beneficial. Delicate skins with a high

susceptibility to irritants must be treated gently. No sea-bathing should be allowed, and only very bland soaps and soft water should be used. In all cases in which the horny layer is extensively lost and the wet mucous layer exposed, water acts osmotically as an irritant, but this may often be corrected by the addition of indifferent substances such as gelatin or starch to the water or, even better, by adding sufficient sodium chloride to make the water isotonic with the body fluids.

We must now consider *internal medication* apart from that aimed at a definite defect of health. The first point to consider is undoubtedly the question of aperients. Since the predisposing cause of many cases of eczema, at any rate in my opinion, is gastro-intestinal toxaemia, it is obvious that a thorough washing out of the tract is commonly beneficial, associated as it usually is with a bland diet and the ingestion of large quantities of water; it must, however, be distinctly understood that purgation can be easily carried too far. In acute cases a temporary depression of the patient is not only harmless but may be of value in subduing the violence of the inflammation, as has been already mentioned, but in chronic cases it is most unwise to add to the depression often existing. Either calomel in a few sharp doses at rather long intervals or a short course of salines may be given, and it is probably wiser to use those salts, such as sodium or magnesium sulphate, which are little or not at all absorbed.

In acute cases for diminishing the vascular excitement antimonial wine in small doses (℥iij.-viij. three times a day) has one or two distinguished advocates; but I have been unable to convince myself of its efficacy in any case. Quinine in large doses (gr. v. three times a day) has a well-marked action in some cases, chiefly those associated with nervous debility, and I can recall one case in which frequently relapsing acute eczema of the face was entirely controlled for weeks by its use, relapsing for a time when the attempt was made to leave it off. In some cases in which there is a sort of urticarial reaction under the eczematous patches calcium lactate (ʒij. twice a week) has occasionally proved of service and is worth a trial.

In chronic cases I have not often found any drug of avail unless directed against some particular constitutional defect. There is, however, a limited number of cases in which arsenic is of value. It should be clearly understood that this drug should never be used in acute but only in rare instances in chronic eczema. The type of chronic disease in which it is likely to prove of service is that in which there is practically no acute inflammation but only a sluggish malnutrition of the part. Such cases tend to the production of a little indolent scaling with a good deal of thickening of the epidermis, especially of the palms, and malformation of the nails, and in these arsenic often appears to stimulate the return to normal. It must, however, be emphatically pointed out that a careful diagnosis must be made in order to avoid the grave error of giving arsenic in a dermatosis already due to the prolonged ingestion of the drug.

The *local treatment* is in most cases the most important part. In the acute erythematous and papular stages cooling and soothing applications should be used. These may be either lotions or powders, or a combination of the two. Of the pure lotions a spirit and lead lotion is generally the best, the addition of opium being useless as it has no local anodyne effect. A good formula is ℞ Liq. plumbi subacetatis ℥ii., spirit. vini rectificati ℥ii., aq. destillatam ad ℥x. This should be mopped on freely and very frequently, and the best way of all is to cover the part with lint and allow the lotion to drop on to it continuously by means of a wick of lint leading from a vessel filled with the lotion and placed above the part. Of the lotions combined with powders either lotio nigra or a calamine lotion may be used. Of the latter the following is a good formula:—℞ Calaminae praeparatae ℥iii., zinci oxidi ℥ii., spiritus vini rectificati ℥ii., glycerini ℥ii., aq. rosae ad ℥viii. The glycerin must be omitted in cases in which it is known that it is ill borne by the skin in health.

In the weeping stage nothing has given such good results in my hands as the recently introduced painting with pure coal-tar (not the liquor picis carbonis). This is a dirty but extremely efficacious remedy. Crude coal-tar contains a good deal of caustic alkali which must be removed by repeated washing of the tar with distilled water. There then remains a black treacly liquid, and the thicker specimens are the best. This is painted on in a thin coating, allowed to dry for about two hours, and then covered, if necessary, with talc powder or muslin. The first sensation is one of brisk burning, but this lasts about ten minutes only and is followed by a sense of great comfort and freedom from itching. The tar dries to a thin protective film and usually need not be reapplied for two or three days. After this interval it will almost invariably be found that the weeping has ceased, the hyperaemia vanished, and that the skin has resumed its elasticity. If necessary the process may be repeated or a bland paste such as Lassar's paste substituted. In using this pure coal-tar there are one or two precautions to be observed. The most important is that it must not be used in cases with obvious pyogenetic infection. If such exist, the part must be carefully cleaned and all crusts removed, and the diseased area painted with weak (1-2 per cent) watery solution of silver nitrate and kept under a wet dressing, preferably lead lotion, for twenty-four hours. This can then be dried off and the tar applied. Secondly, it is generally not advisable to try diluting the tar; but if this is thought necessary lard is the best base, wool-fat and paraffin being unsuitable for the purpose. The tar may be incorporated in equal parts with casein ointment; this has some advantages as it dries more quickly and does not stain the underclothing so much, but in my opinion it is not quite so efficacious. Thirdly, the erythematous and early papular stages should not be treated by this method.

In cases in which there is a good deal of acute inflammation, but the discharge is not very profuse and there is a tendency to fissuring,

a paste or cream is a good application. The former consists of a greasy vehicle containing a high proportion of powder which endows the application with a certain absorbent quality, and the latter contains in addition a large amount of water and is thus more cooling. Typical formulas are:—(1) Acid. salicylici gr. x., pulv. zinci oxidi ʒii., pulv. amyli ʒii., paraffinum molle ad ℥i. (Lassar's zinc paste); and (2) Ol. olivae ℥ss., adipis lanae ʒi., pulv. zinci oxidi ℥ss., aq. calcis ʒiii. (zinc cream). With the latter may be incorporated ichthyol, tar, resorcin, or calomel, but not salicylic acid.

Where the disease has largely subsided but a reddish area with indolent scaling persists, tar in small doses may be used with an ointment:—Liq. picis carbonis ʒss., ung. hydrarg. ammon. ʒi., paraffinum molle ad ℥i.; or Ol. cadini vel ol. betulae albae ♏ xx., cremor zinci (see above) ad ℥iss.

In the finely fissuring or "chapped" eczemas of the extremities Lassar's paste may be used, and often carbolic acid (2 per cent) may with advantage be substituted for the salicylic acid. Eczema of the scrotum and anus must always be dealt with very gently, and the best application is generally the zinc cream, to which may be added 3 per cent of ichthyol and 2 per cent of menthol if the itching is severe.

In chronic eczema of the palms with deep cracking, a very resistant variety, I have found nothing so frequently efficacious as—Acid. salicylic. gr. xv., emplast. plumbi ℥ss., paraffini mollis ℥ss. These should be mixed with heat, spread on thick linen, and kept constantly applied, the dressing being changed night and morning. In this form also the *x*-rays mentioned on p. 325 are often of great service. Eczema of the nails is difficult to treat locally as one cannot get at the matrix. I have tried to deal with it by means of the *x*-rays but without success, and have generally found that some form of tar in about 3 per cent strength incorporated with ung. zinci oleatis is the best application. It must be persisted with for months.

In chronic infective eczemas the part may be either painted with 2 per cent silver nitrate once daily and kept under a lotion for the rest of the twenty-four hours, or mercurials may be used. Of these the most active is the ung. hydrargyri nitratis, especially for the pyogenetic dermatitis of the external auditory meatus and at the back of the pinna. The official ointment is too strong for this purpose, and I find that half a dram of it in an ounce of ung. paraffini is a useful application. In very inflammatory infective types calomel seems to suit particularly well; it may be used in strengths varying from 2 to 6 per cent in zinc cream or zinc paste. Dry infective forms on the lower extremity may be painted with the silver nitrate solution, and, when this has dried, Unna's zinc gelatin mass applied. The best formula is:—℞ Gelatini ʒiij., aquae destillatae ʒvj., glycerini ʒv., pulv. zinci oxidi ʒiij. The mass is generally sold cut up into dice, of which a requisite number should be melted on a water-bath. The liquid should be painted on in one thick coat, allowed to set, dabbed lightly with cotton-wool until the surface becomes felted,

and then covered with a light bandage. The dressing thus applied will generally last nearly a week if the limb be kept out of water.

A peculiarity about the behaviour of the eczema of the flexures is that it can be usually fairly easily subdued, but the skin remains harsh so that relapse frequently occurs. For this condition I am in the habit of using ung. chrysarobini bandaged on, and it is quite surprising how under this very irritating ointment the skin returns to its natural silky texture. It sounds a dangerous treatment, and it certainly requires some experience to know which case will stand it, but I have frequently effected a remarkably rapid cure of even severe cases by this method.

Sulphur has a great and rather exaggerated reputation in eczema. As a matter of fact it is of extraordinary value in the truly seborrhoeic forms, namely those which are associated with an unduly oily condition of the skin. In these it clears off the eruption extremely quickly without any of the caustic action which it so often exerts on the skin. In other types of eczema it has seemed to me to be more often harmful than useful.

*Treatment by x-rays* is chiefly of use in the more chronic traumatic forms, especially those associated with stiffening of the skin and thickening of the epidermis. Such forms are often associated with uncontrollable itching which usually ceases within twenty-four hours of the application. The positions where this form occurs are chiefly the extensor surfaces of the arms and legs and the palms and soles. Undoubtedly large doses with moderately prolonged intervals act best, and rather less than a Sabouraud's pastille dose may be given once in three weeks.

It might be anticipated that the *vaccine treatment* which is so efficacious in other diseases of the skin would prove of signal advantage in eczema. In my experience this is not generally so, and I have seen a large number of cases in which vaccine treatment has been used unavailingly and which have cleared up fairly readily under efficient local treatment. To this statement there are two exceptions: first, the case in which the eczema is becoming complicated with staphylococcic folliculitis, and is evidently about to produce a generalised furunculosis; secondly, in certain infective forms associated with chronic streptococcic fissures. In both these types inoculation, if well carried out, is often of great benefit. But I cannot too strongly urge that the greatest care must be taken to detect the offending micro-organism, and for this purpose mere cultivation is quite inadequate. The scales and discharge must first be examined histologically, and the forms of organism present noted; secondly, cultures should be made, and if possible every type of organism noted in the microscopical examination obtained in pure culture; thirdly, the patient's serum should be examined to determine the opsonic index to each of these organisms, and then if all these proceedings lead to sufficient evidence a vaccine may be made and its effect watched on the clinical condition.

Finally the *eczema of children* deserves a few special remarks. It is

very important to decide whether we are dealing with the seborrhoeic or with the traumatic varieties. In both forms, but especially the traumatic, it is absolutely essential to prevent the child from scratching. Tying up the hands in gloves is quite useless, and for keeping the hands from tearing the face back splints immobilising the elbows are the best. In small infants such splints may be easily made from the corrugated paper used for packing. These should be applied on the extensor sides of the arms, coming well up above and down below the elbows. They should be thoroughly padded, and the arm should be covered with absorbent wool on the flexor aspect as well to prevent the bandage from irritating the skin. Of course the best treatment is that which alleviates itching. For this purpose as well as for its curative effects I can confidently recommend painting with pure coal-tar (*vide* p. 323). It may seem a drastic method to apply to young babies, but although I used it at first with some trepidation, I have never seen anything but the happiest results from its use. Other good applications are: Lotio nigra in full strength or diluted with lime water, the zinc cream already mentioned, to which may be added 3 per cent of ichthyol or calomel, and Lassar's zinc paste. A short course of grey powder sometimes seems to have a good effect, even where there is no recognisable alimentary disturbance, and in all traumatic forms it is well to inquire carefully into the diet and limit the intake of food to the minimum consistent with good health.

The seborrhoeic forms are usually less rebellious than the traumatic; I find that they usually yield to a careful treatment with Lassar's zinc paste or the same base with 2 per cent of resorcin substituted for the salicylic acid. Sulphur does not appear to me to be borne well by the infantile skin, and if used should be incorporated with the zinc paste base. Where the eczema affects deep folds it will often be found advisable to substitute for the ointment a powder such as the following, which I have found useful:—℞ Pulv. calomelanos gr. x., guaiacol ♏ii., pulv. cretae gallicae ad ʒi. The powders should be hand-sifted through lawn. It is not advisable to use fuller's earth unless special precautions be taken with regard to its sterilisation as tetanus has been reported from its use.

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## SCHAMBERG'S DERMATITIS

By T. Colcott Fox, M.B., F.R.C.P.

In 1900 and again in 1901, Schamberg described a peculiar and uncommon affection under the name, "A Peculiar, Progressive, Pigmentary Disease of the Skin." It occurred in a boy, aged fifteen years. The eruption was characterised by the evolution of pin-head-sized, reddish puncta or dots, aggregating gradually into irregular patches, which slowly enlarge by the formation of fresh lesions on the borders. The red puncta in the course of time alter in aspect, and leave a brownish, brownish-yellow, or reddish-brown pigmentation, which slowly fades. This process may be very slow, and occurs without any subjective sensations. This case was under observation for five years. It began on the shins, and spread over the ankles to the dorsum of the feet and above the knees. It also appeared on the flexor aspect of one wrist, and then on the other.

*Histologically* the younger border of a patch displayed dilated lymphatics, and a dense infiltration of the papillary and sub-papillary layers, spreading also to some extent more deeply. The cell infiltration consisted of well-stained lymphoid cells and polymorphonuclear leucocytes, a few mast cells, and here and there epithelioid cells, and some cells derived from connective tissue. The papillary blood-vessels were dilated with proliferated endothelium, and surrounded by dilated perivascular lymph spaces. No pigment cells or granules were seen. In the epithelial layers the rete shewed the invasion of oval or elongated cells or polymorphonuclear leucocytes most marked in the deeper layers. The stratum corneum, stratum granulosum, and stratum lucidum were normal. Lastly the lesion examined was centred by a sweat follicle and duct to which Schamberg attaches significance.

Apparently this eruption is not widely known, but I had no difficulty in recognising the picture on the shins of a young man sent to me for a diagnosis, and I was particularly struck with the red puncta, which were indistinguishable from small punctate telangiectases. In 1902 Dr. W. T. Freeman also demonstrated the condition in a young man, aged 22 years.

T. Colcott Fox.

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T. C. F.

# GENERALISED EXFOLIATIVE DERMATITIS

By H. G. Adamson, M.D., F.R.C.P.

**Introduction.**—In this country the names Pityriasis rubra and Dermatitis exfoliativa have been commonly employed without distinction for a disease characterised by a persistent universal redness of the skin with general desquamation, which may arise as an independent malady or be secondary to some previous eruption.

In France writers have followed Brocq in dividing this affection into at least three distinct groups, namely: (i) a very chronic form with branny desquamation, ultimately fatal—pityriasis rubra of Hebra; (ii) a subacute form with large flaky desquamation, generally ending in recovery —dermatitis exfoliativa of Wilson; and (iii) a subacute form supervening upon some chronic skin eruption in cachectic subjects, and always fatal—herpétides exfoliatrices of Bazin. English writers, whilst agreeing that there are chronic forms, and that cases may be subacute, and "primary," or "secondary" to some previous eruption, have maintained that there is so much variation in the course and symptoms of individual cases that it is impossible in practice to make the sharp distinctions of French authors. Further, whilst French observers include in this group the disease known as recurrent scarlatiniform dermatitis, English writers have generally regarded it as a distinct affection. By most authorities, both French and English, the disease described by Ritter as dermatitis exfoliativa of new-born infants; the epidemic exfoliative dermatitis of Savill and Copeman; and generalised exfoliative dermatitis in association with leukaemia and lymphadenoma, have been approximated to those already mentioned.

Thus we have a long list of affections, all having the common features of universal redness and subsequent generalised desquamation, and included under the heading of general exfoliative dermatitis. These are: (1) Pityriasis rubra of Hebra. (2) Dermatitis exfoliativa of Wilson and Brocq. (3) Secondary generalised exfoliative dermatitis, supervening on eczema, psoriasis, etc., of Buchanan Baxter; divided by Brocq into (*a*) a benign form Érythrodermies épisodiques of Besnier, (*b*) a fatal form Herpétides exfoliatrices of Bazin. (4) Recurrent desquamative scarlatiniform erythema of Féréol. (5) Dermatitis exfoliativa neonatorum of Ritter. (6) Epidemic exfoliative dermatitis of Savill. (7) Generalised exfoliative dermatitis in leukaemia or lymphadenoma. In order to appreciate the views held at the present time about these affections and their relations to one another, a review of the history of the subject is necessary.

**History.**—The term Pityriasis rubra was used by Bateman and other early writers, but Devergie in 1854 first applied it in a definite manner

to an affection in which there was persistent redness of the skin with scaling. Hebra, in 1860, recorded three examples of a disease which he believed to be of the same nature, and laid stress upon the deep-red colour of the whole skin; the absence of infiltration, papules, vesicles, and secretion; the occurrence of a small branny desquamation; the very chronic course with good health at first, then loss of strength; and the ultimate fatal termination. Hebra's description, however, differed in several points from Devergie's; in the affection which had been described by Devergie the scales were larger, the skin was thickened, and recovery sometimes took place.

In 1867 and 1870 Sir Erasmus Wilson described cases which he identified with pityriasis rubra of Hebra, but for which he proposed to substitute the name exfoliative dermatitis or eczema exfoliativum, since the scales were large and thin, not small and branny, that is, pityriasic. Hebra, however, did not admit that Wilson's cases were pityriasis rubra as described by himself. Thus, even at this early stage there was a difference of opinion as to the identity of the pityriasis rubra of Hebra and the dermatitis exfoliativa of Wilson, to which latter type the earlier case of Devergie probably belonged.

A third group was formed when, in 1876, Féréol recorded a case which Vidal, Besnier, and he subsequently named "Pseudo-exanthème d'érythème scarlatiniforme desquamatif récidivant." These observers separated this type of case from pityriasis rubra and exfoliative dermatitis with which affections it had been formerly confused. But, although it is known under the name of recurrent scarlatiniform dermatitis, it is by many regarded as closely related to Wilson's dermatitis exfoliativa.

Then, in 1878, Ritter v. Rittershain gave an account of an exfoliative dermatitis which was seen in an epidemic form in nurslings—dermatitis exfoliativa neonatorum (*vide* p. 177).

In 1879 Buchanan Baxter published a paper upon generalised exfoliative dermatitis, in which he recorded cases to prove that this disease might occur in some persons, not as a primary disease, but as a sequel to some previous skin eruption, particularly eczema, psoriasis, and lichen planus, and he proposed the terms "primary" and "secondary" exfoliative dermatitis.

In 1882 Brocq wrote his classical paper upon dermatitis exfoliativa of Wilson, and insisted that the dermatitis of Wilson was a distinct disease and not to be confused with pityriasis rubra of Hebra. In 1884, in a second monograph on pityriasis rubra, Brocq maintained that under this head there had been ranged distinct affections which merited particular descriptions. He divided these affections into the following groups: (1) Herpétides exfoliatrices malignes de Bazin (secondary generalised exfoliative dermatitis of Baxter). (2) Pityriasis rubra pilaris (now universally admitted to be a distinct disease). (3) Érythèmes scarlatiniformes desquamatifs. (4) Dermatite exfoliatrice généralisée. (5) Pityriasis rubra universalis chronica of Hebra. (6) Perhaps a pityriasis rubra bénigne. (7) Intermediate and at present unclassifiable cases. The

"herpétides exfoliatrices" in Brocq's classification had been so named by Bazin, who had described them in 1860. They corresponded with the so-called secondary generalised exfoliative dermatitis of Buchanan Baxter. So that with the exception of group 6 each of these types had been previously described, and Brocq's chief aim was to define clearly their differences, and more especially to distinguish Wilson's dermatitis exfoliativa from Hebra's pityriasis rubra. In England Brocq's classification has been criticised as too elaborate, and, as already stated, many dermatologists in this country continue to use the titles pityriasis rubra and exfoliative dermatitis as synonymous, and do not distinguish between cases of "primary" and "secondary" origin when once established. Until recently German and Austrian writers used only Hebra's title of pityriasis rubra. But they have added gradually to the original type-cases of Hebra others with more acute course and symptoms, and more recently many German writers have adopted the term dermatitis exfoliativa for the latter class of cases.

Since the appearance of Brocq's monographs many cases and papers have been published, and several discussions have taken place—notably, in 1889 at the International Congress in Paris, in 1898 by the Dermatological Society of London, and in 1905 and 1906 by the American Dermatological Association. But no great addition has been made to our knowledge of this subject. Brocq's most recent articles in *La Pratique dermatologique* and in his own book, *Dermatologie pratique*, are substantially the same as his earlier papers. Probably the chief advance has been in the accumulation of evidence that these generalised exfoliative dermatitides are toxaemic in origin, while much interest has centred round the suggestion, first made by Jadassohn in 1892 and supported by many subsequent observers, that cases of Hebra's type are in some way related to tuberculosis.

**Etiology.**—There is a tendency at the present time to look upon all forms of generalised exfoliative dermatitis as of toxaemic origin, the toxic agent varying in different types and perhaps also in individual cases of the same type. The toxins may be autotoxins, bacteriotoxins, or, in many instances, chemical poisons. This view is based upon the clinical resemblance to exfoliative dermatitis of certain, usually more ephemeral, generalised erythemas with subsequent desquamation, which may follow the administration of various drugs; upon the fact that more persistent erythemas with desquamation, resembling, if not identical with, dermatitis exfoliativa, have been set up by the internal administration of drugs —especially of mercury; and upon the suggestion, supported by a certain amount of clinical evidence, that the more chronic forms, namely those of the type of pityriasis rubra of Hebra, are toxi-tuberculides.

The **Histo-pathology** of this group has been studied by Hebra, Elsenberg, Cahn, Leloir and Vidal, Crocker, Petrini and Babes, Jadassohn, Doutrelepont, Török, Kanitz, Bruusgaard, Kopylowski and Wielowieyski, Halle, Foster, and Polland. The results are discordant in many respects, probably because, as suggested by Török, different stages

or different types of the affection have been examined. In general, it may be said, there has been found a cellular infiltration of the dermis, in the earlier stages or subacute forms confined to the papillary region, in later stages or more acute forms, also more deeply, around the follicles and sweat glands. The prickle-cell layer of the epidermis has been described as thinned, often with long processes dipping down between the papillae; the stratum granulosum as diminished or absent, with parakeratosis of the horny layer. Some observers have seen new connective-tissue cells and giant cells, and mast cells in abundance. In the later stages of the pityriasis rubra type there has been atrophy of the glands and follicles, with marked thinning of the epidermis, giving the appearance of scar tissue with a thin layer of epidermis over it. In long-standing cases abundant deposit of pigment has been noted in the dermis. The conditions found indicate a subacute inflammation, passing on to atrophy in the later stages.

Little light, however, is thrown upon the pathogenesis of the affection by these histological examinations, and, as Unna has pointed out, the two main clinical features—the striking, long-persistent hyperaemia and the late atrophy—still await a clear histological explanation. Moreover, it is not possible, from the results of these recorded observations, to frame any rules by which a differential diagnosis of the various types of this disease can be made from the histological appearances.

Unna has remarked, in regard to the morbid anatomy of dermatitis exfoliativa of the Wilson-Brocq type and of pityriasis rubra of Hebra, that it is to be hoped that the differential diagnosis of these two affections in their histological relation will be further and thoroughly investigated. But there is a tendency now to regard the varied histological appearances found in the different cases as merely stages of the same process.

**Clinical Description.**—The following description of these affections will be based upon the view that (i) recurrent scarlatiniform erythema, (ii) dermatitis exfoliativa of Wilson—whether primary or secondary, (iii) and pityriasis rubra of Hebra are different, though closely allied, types of the same disease, which are bound together by intermediate forms. Dermatitis exfoliativa of infants and epidemic dermatitis will be regarded as probably of a different nature; and generalised exfoliative dermatitis in association with leukaemia or lymphadenoma will not be included in the group.

**Recurrent Desquamative Scarlatiniform Erythema** (Féréol, Besnier). —Although many writers consider this affection as distinct from generalised exfoliative dermatitis, Brocq and others regard it as an acute type of this disease, and descriptions have been given of subacute and prolonged cases which connect it with the more chronic forms. But whichever of these views be taken, there can be no doubt that it is an allied condition, and, as Sir Stephen Mackenzie aptly remarked, its study may serve to guide us to the true nature of exfoliative dermatitis.

The *cause* of this affection is not yet determined with certainty, but it is probably a toxaemia. A very similar state may be produced by the ingestion of certain drugs: mercury, quinine, opium, belladonna, chloral, phenazone, etc.; then, as a rule, there is but a single attack. In the majority of cases no evidence of drug administration is forthcoming; though sometimes the first attack may appear to have been excited in this way, the subsequent attacks being without this association. The condition is said to occur in connexion with albuminuria, with gonorrhoea, with pyogenetic infection, and with the ingestion of certain foods. Besnier suggested that there was a predisposition in certain persons, and that the eruption might be determined by different internal toxic agents or local irritants, and that the exciting cause of the various attacks might not be the same.

*Symptoms.*—This affection begins with a general disturbance of health of two or three days' duration, shewn by nausea, headache, shivering, and sometimes vomiting, with more or less fever (100° – 103° F.). In some cases there may be pains and even swelling of the joints during this preliminary stage. This period of malaise is followed by a universal bright scarlet punctate or macular eruption, which begins as red itching patches and quickly becomes generalised. The mucous membranes are reddened, but without the "strawberry" tongue of scarlet fever. According to Bowen, the face may be oedematous and swollen. In a very few days desquamation begins, and the temperature then falls. The superficial epidermis may be shed from the hands and the feet *en masse*, like gloves and sandals. The nails are seldom shed, though this has been recorded (Warner, Crocker, and Bowen). There is, however, interference with the nail nutrition, as shewn by the subsequent appearance of transverse furrows. The hair, as a rule, does not fall. When the flaky desquamation is completed there still remain fine branny scales for a week or more. Relapses are common, and the course of the disease may sometimes be prolonged for several weeks. As indicated by its name, a feature of the disease is that there may be recurrences at intervals of months and years. Brocq says that the earlier attacks are the more severe, but Crocker stated that the reverse may hold good. The first attack is commonly at about the age of thirty to forty years, but it may occur at any age.

The *prognosis* is good for any attack, but the probability of future attacks must always be borne in mind.

The *diagnosis* from scarlet fever may be difficult, and cases are recorded which have on several occasions been mistaken for scarlet fever. The points of distinction are: (i) The very deep-red colour of the eruption; (ii) The early desquamation before the erythema has begun to fade; (iii) The absence of marked soreness of the throat, and of the "strawberry" tongue; (iv) The absence of evidence of contagion; (v) The occurrence of previous attacks.

*Treatment* should be confined to simple measures, rest in bed and the application of a greasy substance. Internal medicaments and external

application of drugs should be avoided. Very careful inquiry should be made as to the use of drugs in any form—and especially mercury—with a view to the prevention, if possible, of future attacks.

**Dermatitis Exfoliativa of the Wilson Type.**—*Etiology.*—According to some writers, nervous instability or profound nervous disturbances may play an important part. The condition has appeared immediately after a prolonged and severe cross-examination in the witness-box (Pringle), after severe fright (Schamberg), and shortly after shipwreck (S. Mackenzie). It is possible that, even in these cases, auto-intoxication or metabolic disturbances may have been the immediate cause of the affection. Exposure to wet and cold appears to have excited the attack in some cases, notably in those described by Wilson. Dr. Pringle is strongly of opinion that alcoholism is often a predisposing cause; but Sir S. Mackenzie found this antecedent in three only of 23 cases, two of this series being life-long abstainers. Brocq says that these patients are frequently alcoholic, not necessarily from excessive drinking, but on account of an individual susceptibility to ordinary or even small doses. He also raises the question whether the administration of mercury may not provoke an attack of generalised exfoliative dermatitis, as it may do of scarlatiniform erythema. Bowen has reported a fatal case of dermatitis exfoliativa, due to the local action of mercury.

Many examples have been recorded in this country and in America in which the local application of drugs other than mercury has excited a generalised exfoliative dermatitis. Chrysarobin and tar particularly have been offenders in this respect, and they have usually been applied for chronic psoriasis or eczema, and British writers have maintained that when once established these secondary forms of dermatitis exfoliativa are indistinguishable from primary forms, though Brocq and most French writers regard them as distinct.

Other instances are recorded in which a generalised exfoliative dermatitis has developed in patients with a chronic skin complaint, such as psoriasis or eczema, without any apparent exciting cause in the way of a local application. It has been frequently pointed out that the generalised dermatitis is not a mere extension of the original disease, but one of a new and particular kind.

*Symptoms.*—The disease begins with an erythematous itching patch or patches, which quickly extend so that in the course of a few days to a few weeks the eruption is generalised. The skin is then everywhere intensely red, without any sound interval. The tint varies in individuals and in different regions, sometimes becoming violaceous on the lower extremities. The skin is dry, except where excoriated by scratching. After the redness has been present for a few days desquamation begins, and becomes so abundant that the patient's bed is filled with scales, which may be collected in handfuls. The scales are thin and papery, and there is no suggestion of crust formation, nor of exudation beneath the scales. They are large, and adherent at one border and free elsewhere, overlapping sometimes like the tiles of a roof. In other

cases the scales may be adherent at their central part. On the face they may be small, and on the scalp branny and caked together. The epidermis often separates from the palms and soles in large glove-like or sandal-like masses. The hair falls partially or completely. The nails may be shed entirely or partially separated from their beds.

In the secondary cases, or those developing upon some pre-existing eruption, the course is the same. When the erythema and desquamation have reached their acme, no distinction can be made from primary cases, for the original eruption has then quite lost its character. In the

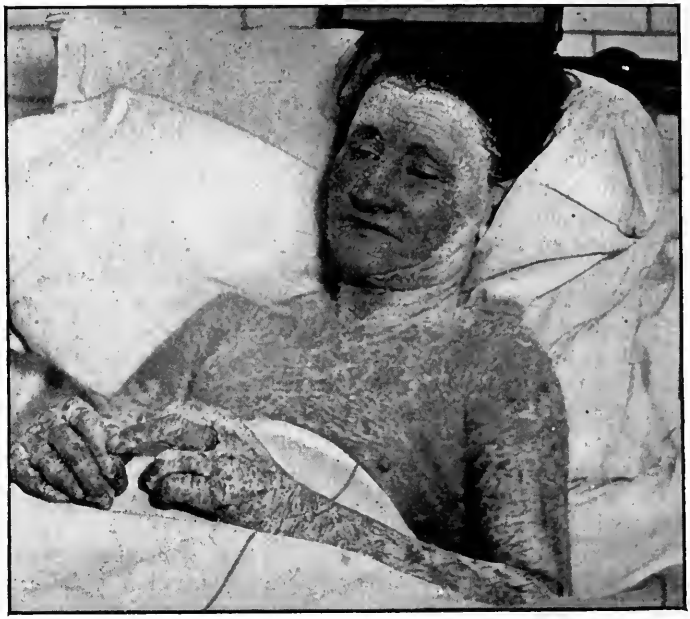

FIG. 70.—Dermatitis exfoliativa (reproduced by Dr. A. Whitfield's kind permission).

secondary cases, frequently, but not always, the generalised dermatitis follows the local application of some local irritant, such, for example, as chrysarobin, which may have been used in the treatment of the original eruption. The mucous membranes are often involved; the conjunctivae may be inflamed, and the tongue red and fissured.

Itching is often a prominent feature, and may be one of the earliest symptoms to attract attention. But it may be absent. There is almost always a marked sensitiveness to cold. There is in most cases a rapid loss of strength, and often of weight, although the appetite may remain fair and the digestion good.

The urine is generally free from albumin and sugar, but albumin has been noted in some cases, and its presence is regarded as indicating a greater gravity in the prognosis (Malcolm Morris, Pringle). Dr.

Pringle has mentioned cases in which the patient became insane, and places insomnia and insanity among the leading symptoms.

The majority of cases are apyrexial throughout. In some cases the

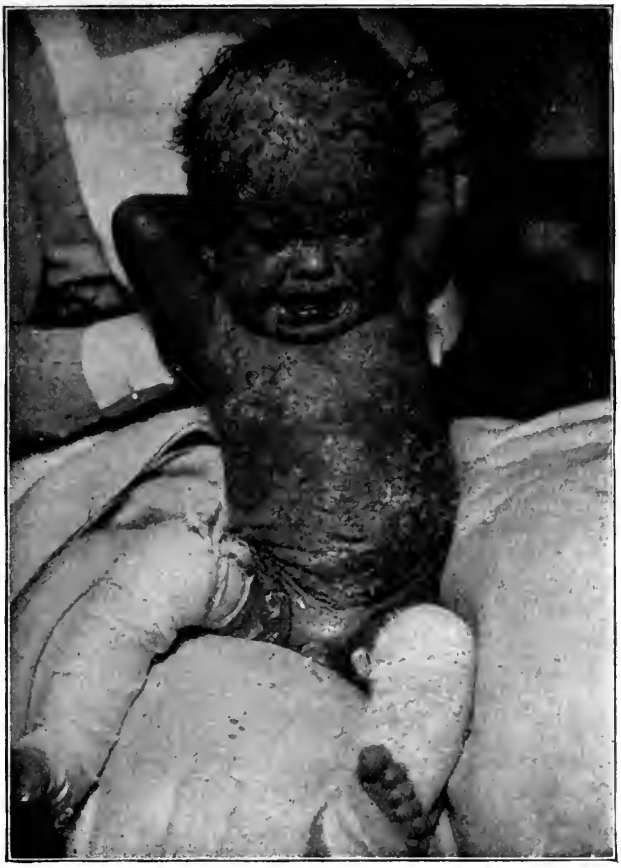

FIG. 71.—Dermatitis exfoliativa in an infant of twelve months. There was intense redness of the skin, abundant flaky desquamation, and some pruritus of six months' duration. There were no signs of bullous formation. Under local treatment with greasy applications the condition improved; but three months later the eruption was only kept in check by the same means. The case is to be distinguished from the generalised infantile dermatitis of Ritter, and from a generalised seborrhoeic dermatitis. It had all the features of a true dermatitis exfoliativa.

eruption is immediately preceded by chilliness, malaise, and slight fever, and these symptoms may continue for a time. The course of the disease may be characterised by irregular fever, with evening exacerbations, and a high temperature with rigors has been recorded in some cases. Febrile outbursts often correspond with some complication.

The age of patients attacked is more often that of middle life and onwards, but cases have been recorded in childhood, and also in

infancy, apart from the type described as dermatitis exfoliativa neonatorum of Ritter.

The *prognosis* as regards duration, recurrences, and ultimate recovery or fatal termination, is most uncertain. Some patients may get well in a few months, in others the disease may go on for years with ultimate recovery. But even after complete recovery there is a great liability to renewed attacks. On the other hand, death from exhaustion, with diarrhoea, bronchopneumonia, or other complications, may take place after

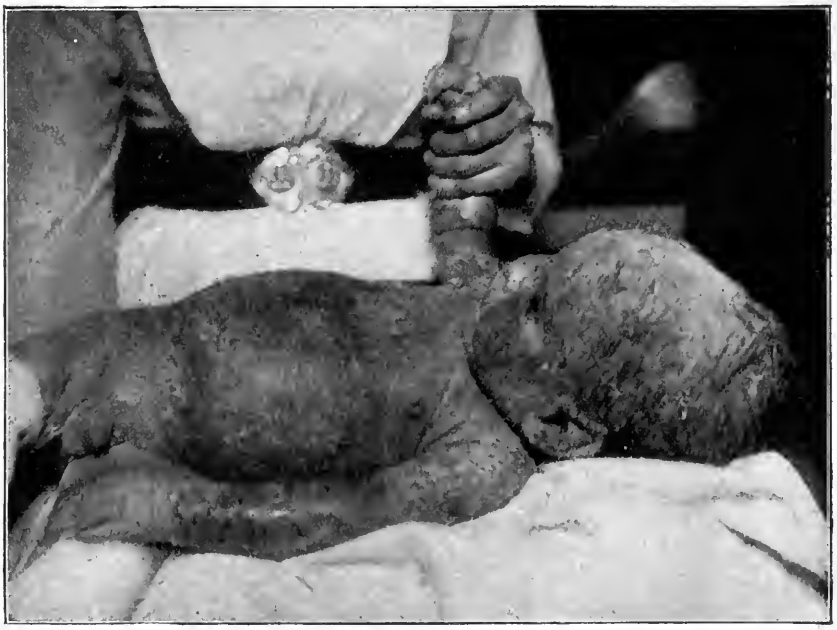

FIG. 72.—Another view of the same case as in Fig. 71.

a few weeks or months, or it may occur only after years, so that a case which may have commenced as a dermatitis exfoliativa of the Wilson type then approaches the Hebra type of pityriasis rubra.

This is the conception of the disease of most British and American writers, who maintain that, when once established, no distinction can be drawn between cases arising spontaneously or primarily and those which are secondary to some pre-existing eruption. Brocq and most French writers divide these cases into three distinct groups, namely, a primary form and two secondary forms. These are:—(i) *Dermatite exfoliative généralisée proprement dite subaiguë* (primary exfoliative dermatitis of Baxter), characterised at its period of full development by an intense generalised redness of the skin, an abundant and repeated lamellar exfoliation, fall of the hair and nails, general symptoms of fever, prostration and marked weakness: sometimes fatal ($\frac{1}{6}$th of the

cases), but generally ending in complete cure after four to six months' duration, though sometimes prolonged to eight to twelve months by relapses or by complications, but which, once cured, does not return. (ii) *Érythrodermies épisodiques* of Besnier, in which there occur acute, almost generalised outbursts in the course of psoriasis, or seborrhoeic dermatitis, of lichen planus, or of pityriasis rubra pilaris; these outbursts having, usually, not a long duration, not becoming absolutely generalised, and almost always consecutive to the local application of a drug—chrysarobin or mercurial preparations especially—or to the internal administration of a harmful substance. These outbreaks are ephemeral or may be prolonged for several weeks, and they are prone to recur. (iii) *Herpétides exfoliantes* of Bazin (*Érythrodermies exfoliantes secondaires terminales ou cachectiques* of Besnier, Secondary generalised exfoliative dermatitides of Baxter), in which the eruption supervenes upon chronic and rebellious ezcema, seborrhoeic dermatitis, psoriasis, pemphigus, or dermatitis herpetiformis in debilitated subjects; and differing from the primary exfoliative dermatitis of Wilson-Brocq in that the fever is less marked, the general debility more so, and a fatal termination constant.

**Pityriasis Rubra (Hebra).**—This type is of very rare occurrence. It is characterised by its long duration, the fineness of the desquamation, the atrophy of the skin in the later stages, and its fatal ending. It begins as bright red patches in various regions, especially in the large flexures. These patches become covered with fine scales, and gradually extend until, in the course of months or years, the whole skin becomes red without any clear interval. On the lower limbs the skin is often livid in hue, especially while the patient is in the erect posture. On the palms and soles it is paler than elsewhere. The colour is altered by heat or cold; warmth produces a vermilion red, cold a bluish-red tint. There is a constant desquamation of fine branny scales. There are no vesicles, fissures, nor weeping, and there is no infiltration. Itching may occur, but usually it is not marked, the chief subjective symptom being a feeling of coldness. The general health is not at first affected, but gradually the strength fails. In the course of time the skin becomes atrophied and retracted, so that movements are impeded. Ulcerations occur at points of tension or pressure. The hair falls, and the nails become brittle and deformed, but are not shed. Towards the end the skin becomes paler, and of a yellowish hue. The whole course of the disease may be many years. Frequently the lymphatic glands are swollen. Jadassohn, in 1892, shewed that many of these patients become tuberculous. In eight necropsies which had been recorded there had been undoubted tuberculosis in seven, either in the lungs or in other organs. Many others have since found tuberculosis of the enlarged glands or of the viscera, and Foster (in 1908) stated that out of 40 recorded cases of pityriasis rubra, 13 or 32·5 per cent were certainly tuberculous. It has been suggested that the affection is a toxi-tuberculide, but some authorities are of opinion that the occurrence of tuberculosis is secondary.

**Diagnosis.**—The main features which characterise dermatitis exfolia-

tiva and distinguish it from other universal scaly eruptions are the intense redness of the skin, the redness being dry with absence of vesication, exudation or crusting, and the profuse and continued desquamation.

Eczema, psoriasis, pemphigus foliaceus, and dermatitis herpetiformis may become generalised; but these generalised eruptions are to be distinguished from dermatitis exfoliativa, whether primary or secondary to a previous eruption.

In generalised *eczema* the eruption is rarely, if ever, universal. The reddened skin is oedematous, and there are crusts rather than scales. In *psoriasis universalis* there are neither crusts nor weeping surfaces, but the scales have the characteristic mica-like appearance, and on scraping them off, the smooth red surface with bleeding points is reached. Psoriasis is probably never universal, and the sharply-margined character of the patches can somewhere be made out.

From the rare disease *pemphigus foliaceus* the diagnosis may be difficult; but careful examination will generally reveal somewhere the flaccid bullous lesions which are characteristic of pemphigus foliaceus, whilst the surface beneath the scales will be moist and weeping, not dry as in dermatitis exfoliativa. A case of pemphigus foliaceus which had been so diagnosed by Dr. Pringle fifteen years ago, and which was recently under my care still suffering from the same complaint, had at one time the appearances of a generalised exfoliative dermatitis.

*Dermatitis herpetiformis* may become universal and simulate dermatitis exfoliativa, as in a case which was for many months under the care first of Dr. Payne, then of Sir Stephen Mackenzie, with what appeared to be a typical dermatitis exfoliativa, but which was subsequently seen by Dr. Colcott Fox with a less extensive eruption of eccentrically spreading rings of abortive vesicles and diagnosed by him as dermatitis herpetiformis, and which later again became universal with the appearances of generalised exfoliative dermatitis (*vide* p. 453).

Other conditions which might be mistaken for dermatitis exfoliativa are the premycotic stage of *mycosis fungoides*, and a generalised exfoliative dermatitis associated with leukaemia or with lymphadenoma have already been mentioned. Such cases have been described by Peter, Audry, Elsenberg, Nicolau, and Wechselmann. In Nicolau's case there was enlargement of the glands and of the spleen, and a relative increase of lymphocytes in the blood. The generalised erythrodermia was associated with fine scaly pityriasis and with pruritus. The hair and nails did not fall. Crocker mentions a case of mycosis fungoides in which the premycotic eruption was universal and indistinguishable from pityriasis rubra.

In making a diagnosis of dermatitis exfoliativa attention should be paid to the existence or not of any previous eruption; whether or not drugs have been taken or applied externally; the presence of albuminuria, evidence of tuberculosis, and examination of the blood.

*Dermatitis Exfoliativa Neonatorum* (Ritter's disease).—This disease was first described by Ritter von Rittershain in 1878 as an affection occurring

in new-born infants in Foundling Institutions. In Prague, Ritter saw 297 cases during ten years. Only small epidemics or sporadic cases have since been reported. Ritter regarded it as of pyaemic origin; others—notably Behrend and Brocq—have considered that it is related to *pemphigus foliaceus* of Cazenave. The more modern view is that it was a form of pemphigus neonatorum which is now known to be a bullous type of impetigo contagiosa of streptococcic origin. Ritter found that it appeared generally between the second and fifth week, rarely before the end of the first week, as a diffuse redness on the lower part of the face which spread rapidly and became universal in the course of a few days. Synchronously with the hyperaemia, exfoliation of the epidermis began. Great variations were presented at this stage. The exfoliation might occur without any evidences of exudation, or there might be irregularly-shaped flat bullae. The disease ran its course in from seven to ten days, but mild relapses sometimes took place. In the fatal cases death resulted from the intensity of the attack or from sequels, such as furunculosis, followed by general sepsis or by gangrene. That the affection was really a form of pemphigus neonatorum is suggested by Ritter's statement that bullae were often present, and that it was liable to be confounded with pemphigus. In the light of the modern conception of this affection it cannot, therefore, be included in the group of dermatitis exfoliativa.

*Epidemic Exfoliative Dermatitis.*—In the autumn of 1891, an epidemic of an acute skin disease appeared in the Poor Law Infirmaries of Paddington (163 cases), of St. Marylebone (193 cases), and of Lambeth (25 cases), and smaller outbreaks in other institutions. It occurred in two main types—a moist form resembling eczema, and a dry one like generalised exfoliative dermatitis. Of the inmates of Paddington Infirmary 19·2 per cent were attacked. The majority of the patients were middle-aged or old, but a few were young people or children, the inhabitants of these institutions being mostly old or broken-down persons. There were, as a rule, no premonitory general symptoms, though some had diarrhoea, or vomiting, or sore throat. It began as a papulo-erythematous, erythematous, or vesicular eruption in patches. The patches became confluent until the whole skin was deep red, infiltrated, and covered with abundant scales. In some cases the eruption was limited to patches of varying size. The majority of cases presented moist exudation and vesication, but in some cases the skin remained dry throughout. In a few the earliest lesions were of a circinate or serpiginous character, like the lesions of tinea circinata. The crimson colour remained, and the exfoliation continued for several days or weeks. Relapses were common, and the average duration of the attack was about seven weeks. In most cases the hair fell, and the nails were shed. Eighteen cases died. The exact nature and the origin of the disease were not determined. Dr. Risien Russell found an organism which Dr. Andrewes believed to be *Staphylococcus epidermidis albus.* Dr. Monckton Copeman, from the investigation of outbreaks which occurred in the Bethnal Green and Shoreditch Infirmaries, was of opinion that contaminated milk was a factor in

their causation. In a later epidemic in the Central London Sick Asylum, Hendon, reported to the Local Government Board by Dr. Copeman in 1904, in which sixty-eight persons were attacked and two died, it was shewn that formalin was present in the milk, and when those suffering from the affection were put on Swiss milk they all began to improve.

Although in many of the generalised cases the condition was like that of dermatitis exfoliativa, the frequent presence of exudation in others and the epidemic character of the affection are features which do not belong to this complaint.

**Treatment.**—In every case the patient must be confined to bed, in order to maintain a uniform temperature, and for the proper application of local treatment. Most authorities recommend oily or greasy applications, but Sir S. Mackenzie was very strongly in favour of a watery application. His plan was to employ a roughly made jacket, trousers, and socks of lint, and a lint-mask, which were kept constantly soaked in a lotion of glycerin of subacetate of lead (℥i.) and pure glycerin (℥i.) to one pint of water. A basin of the lotion, warmed in cold weather, stood at the patient's side and was constantly squeezed over the lint, which was never allowed to get dry. Great care was taken to avoid chill. When the hyperaemia diminished, a greasy application was substituted. Other writers have employed, as greasy applications, Lassar's paste (without salicylic acid), thickly spread on butter-muslin; linimentum calaminae; and simple vaseline. One of the cleanest, most readily applied, and most effective applications is paraffinum liquidum. In some cases prolonged baths give good results, in others these are too exhausting.

Internal treatment has little or no effect. Crocker recommended quinine in full doses as the best treatment in acute febrile cases. Arsenic was at one time largely used, but is now given up as useless, or even harmful. In fact, internal administration of drugs can only be empirical in the present state of our knowledge, and having regard to the possible part played by these as an etiological factor in some cases, it would seem better to rely on careful nursing and the local applications indicated.

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## PITYRIASIS RUBRA PILARIS

SYNONYMS.—*Pityriasis pilaris* (Devergie); *Lichen ruber acuminatus* (Hebra-Kaposi).

By H. G. ADAMSON, M.D., F.R.C.P.

**History.**—This rare disease is a chronic affection of the skin, in which there occur a more or less generalised redness and scaliness, with horny papules seated at the hair follicles, usually without disturbance of the general health. For many years there was a difference of opinion on the question whether the disease described by Devergie in 1857, under the name of pityriasis pilaris, was the same as that described by Hebra in 1860 as lichen ruber; and, although most observers now agree that these two affections are one, some few still maintain that they are distinct. As this controversy is fully detailed in the article on Lichen (pp. 405, 419) only a brief reference to it need be given here. Not until 1889 was there any suggestion that pityriasis pilaris and lichen ruber are the same disease, and up to this point their histories must be traced separately. The first recorded case is one which was treated in St. Bartholomew's Hospital in 1828, and communicated to Rayer by his pupil Tarral, an English physician. Rayer recorded this case as one of general psoriasis. In 1857 Devergie recalled Tarral's case and published two similar examples, distinguishing them from psoriasis under the name of pityriasis pilaris. In 1877, at the instigation of Besnier, Richaud published a thesis on Devergie's pityriasis pilaris. He recorded 8 cases: the Tarral-Rayer case, Devergie's two cases, a case published by Tilbury Fox in 1871, two unpublished cases of Lailler, and two of Besnier's cases. To Richaud's graphic description of the disease there is little to add, even at the present day. In 1889, twelve years after Richaud's thesis, Besnier himself wrote an exhaustive monograph on the disease, and added the word "rubra" to its name. He collected altogether 28 cases.

We have now to follow the history of lichen ruber to this same period. In 1860 Hebra gave a description, based upon 14 cases, of an

affection which he called lichen ruber, and which almost always ended fatally. In 1877, after the study of further cases, Kaposi, with Hebra's consent, subdivided lichen ruber into lichen ruber acuminatus (or the old lichen ruber) and lichen ruber planus (or Wilson's recently described lichen planus). In 1883 Robinson of New York shewed that lichen ruber of Hebra and Wilson's lichen planus were not related, but represented two entirely different diseases; and at the meeting of the American Dermatological Association in 1887 this view began to be accepted. Taylor of New York finally settled this question by his paper in 1889 on the distinction between lichen ruber (Hebra) and lichen planus (Wilson).

This now brings us to the date of the publication of Besnier's monograph on pityriasis rubra pilaris, which in Taylor's case of lichen ruber is quoted as a typical example of pityriasis rubra pilaris. In the same year (1889) the question of the identity of these two affections was warmly discussed at the Dermatological Congress in Paris. In 1892 the matter seemed to be finally cleared up when Kaposi on one side and the French observers on the other claimed the same case as lichen ruber acuminatus and as pityriasis rubra pilaris. Additional evidence is afforded by two plates published by Hebra in Bärensprung and Hebra's *Atlas* in 1869, which depict an eruption identical with that described by the French and American writers.

Yet for some observers there still remains the difficulty that of Hebra's first 14 cases 12 were fatal, whereas the disease we know as pityriasis rubra pilaris is never fatal. Among those who claim that Hebra's original cases, which he called lichen ruber and afterwards lichen ruber acuminatus, constitute a different disease are Neumann and Neisser.

Since Besnier's paper in 1889 many examples of the disease have been described, generally as Pityriasis rubra pilaris. Among others may be mentioned the cases of Fagge, Jamieson, S. West, A. Morton, Liddell, Little, Galloway, Whitfield, and Ormerod in this country; of White, Zeisler, Ravogli, Heidingsfeld, Stelwagon in America; Galewsky, du Castel, Hudelo and Hérisson on the Continent.

**Etiology.**—The cause of this affection is at present unknown. It is, as originally pointed out by Richaud, a disease which attacks the entire epidermic system, and perhaps the hypothesis which would best explain its nature is that it is of toxic origin. Recently Milian's suggestion that it is a toxi-tuberculide has gained many supporters, especially in France. Milían points out that of the 23 cases with full records, of the 28 examples collected by Besnier, 12, or 52·17 per cent, shewed certain evidence of tuberculosis, and that in 82·6 per cent there was a probability of tuberculosis. He reports a case shewing a general and a local reaction with injection of 0·006 c.c. of old tuberculin, and an improvement of the condition after its use. Dr. Sequeira has mentioned a personal case which gave a reaction to tuberculin. But in some recorded cases there was no reaction to tuberculin, and further evidence is required before this view of a tuberculous origin can be accepted.

*Sex and Age.*—The disease is rather more common in males, and it

begins most often in children or in young adults. Several cases starting in early childhood have been published; for example, Rasch's case at two and a half years, Dr. S. West's at three years, Dr. A. J. Hall's at four and a half years, Dr. Graham Little's at five years, and Hudelo and Hérisson's at two years.

**The morbid anatomy** of the lesions has been studied by many observers; by Jacquet in Besnier's cases, by Taylor, Heidingsfeld, Hartzell, Liddell, Coats (in Morton's case), Neisser, Mourek, and others. The descriptions and the drawings or photomicrographs published are of remarkable uniformity, and give a clear idea of the pathological anatomy of the affection, but without throwing much light upon the true nature of the disease. The lesion consists mainly of a hyperkeratosis, general but especially marked in the pilo-sebaceous follicles. All layers of the epidermis shew some widening, and the thickened horny layer is the result of a true hyperkeratosis of non-nucleated horny cells. The infundibulum of the hair follicle, which corresponds to a papule, is dilated and plugged with concentric layers of horny cells. There is but a slight cell-infiltration in the corium, chiefly in the papillae which are widened, and around the hair follicles. The cell infiltration is made up of round cells with a few mast cells. The sweat ducts may also shew hyperkeratosis. The deduction to be drawn from the clinical features and the morbid anatomy is that there is a general hyperkeratosis with special incidence at the follicles, accompanied by hyperaemia and followed by a slight inflammatory infiltration.

**Symptoms.**—The eruption frequently involves the greater part of the skin surface, but is usually unaccompanied by any disturbance of the general health. The main features of the eruption are indicated by its name. These are scaliness, redness, and follicular papules. The first thing which strikes the observer is that the trunk and parts of the limbs present large red scaly areas, often so extensive that only small patches of normal skin remain. In addition, the scalp is covered with thick scales, the face is reddened and pityriasic, the palms and soles are scaly and fissured, and in some parts, particularly upon the backs of the hands and fingers, the hair follicles are picked out by red papules. Sometimes the nails are thickened and roughened. Subjective symptoms are often absent, but the patient may complain of itching and may be very sensitive to cold.

As is shewn by the histological anatomy, the eruption is mainly a hyperkeratosis. But since different appearances are produced in different parts by this one process it is necessary to describe the eruption as it occurs in various regions.

The scalp is the seat of thick whitish scales, with little or no redness and without loss of hair. The face presents a diffuse redness with fine adherent scales, but there is no tendency to papule formation. Sometimes the tension of the skin produces ectropion (Fig. 73). The palms and soles are reddish-brown in colour, with the epidermis thickened, dry, and fissured, or peeling off in large flakes. The scaly area often ends abruptly,

with a sharp margin, at the borders of the palms and soles. The nails are striated longitudinally and grooved transversely. They may be

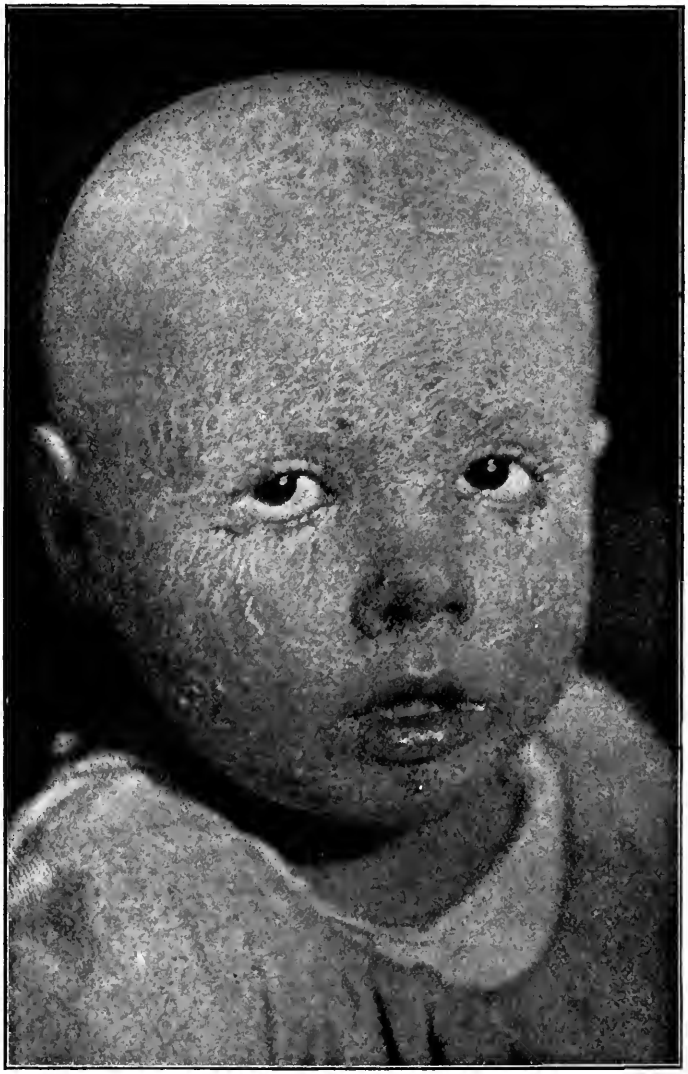

FIG. 73.—Pityriasis rubra pilaris. The skin of the face was reddened, with diffuse scaliness. Note the slight ectropion. (From a photograph kindly lent by Dr. A. Whitfield.)

thickened, with loss of transparency; sometimes they are pitted. On the trunk the eruption consists of large red scaly areas, sometimes with sharp margins, and leaving islands of healthy skin with concave borders;

sometimes fading off gradually at the margins and bordered by isolated follicular papules. In extensive cases these areas may cover almost the whole trunk. Similar areas may extend on to the limbs. Although these areas may bear some resemblance to psoriasis, the scaling is less silvery and never laminated, so that when scraped away new scales do not continue to form as in psoriasis. In long-standing cases the red areas may be quadrillated or marked by cross-groovings, and at the flexures of the joints there may be deep folds in the skin. Sometimes they are obviously made up of closely set follicular papules joined together by the reddened hyperkeratotic intervening skin; in others the papulation is altogether masked. In a typical case neither the trunk nor the limbs are completely covered with these uniform sheets, but they present, in parts, closely set follicular papules. In these parts the fact that every follicle is the seat of a papule gives the appearance which has been likened to a nutmeg grater or rasp, or, by Besnier, to the skin of a plucked fowl. The follicular papules are the most characteristic lesions of the eruption, and without their presence it would be impossible to make a certain diagnosis. Their most distinctive position is upon the backs of the first and second phalanges of the fingers and upon the backs of the hands (Fig. 74), but they occur also upon the limbs, upon the trunk, and upon the sides of the neck. On the limbs they are most abundant upon the extensor surfaces; on the trunk, upon the lower part of the abdomen. But they may occupy any part except the face and the palms and the soles, and in some cases may occur over almost the whole body. The occurrence of each papule round a follicle gives them the striking appearance of being evenly spaced. The individual papules vary in size from a small pin's head to a millet seed, or somewhat larger. They may be pale yellow, pink, red, or brownish-red in colour. They are capped with a small horny mass which plugs the mouth of the follicle. On the backs of the fingers this horny plug often has a characteristic blackened appearance. In certain positions, particularly upon the fronts of the knees, the scaliness may be so marked that heaped-up plaster-like masses are formed. In some cases itching is complained of, and this may become intense. In other cases the skin is hypersensitive to cold. Usually, as has been already stated, there is no disturbance of the general health, but Crocker remarked that too much stress has been laid on the absence of constitutional symptoms. Though true, he says, of the majority of cases, much depends on whether the disease develops slowly or rapidly, and he quotes a case, sent to him by Savill, which ran a short course, and the onset of which was marked by prostration, malaise, vomiting, and other digestive symptoms. Such cases possibly connect the more benign forms with the original fatal cases of Hebra.

*Evolution and Course.*—Usually the first symptoms are a scaliness of the scalp and a thickening of the epidermis of the palms and soles. These are followed by the appearance of follicular papules and red scaly areas. In some cases the onset may be rather rapid, in others very gradual. In a few cases the erythematous element has been marked at

the onset, and there have been febrile symptoms, as in Savill's case and in cases reported by Morton, Salewsky, and Bronson. In the large

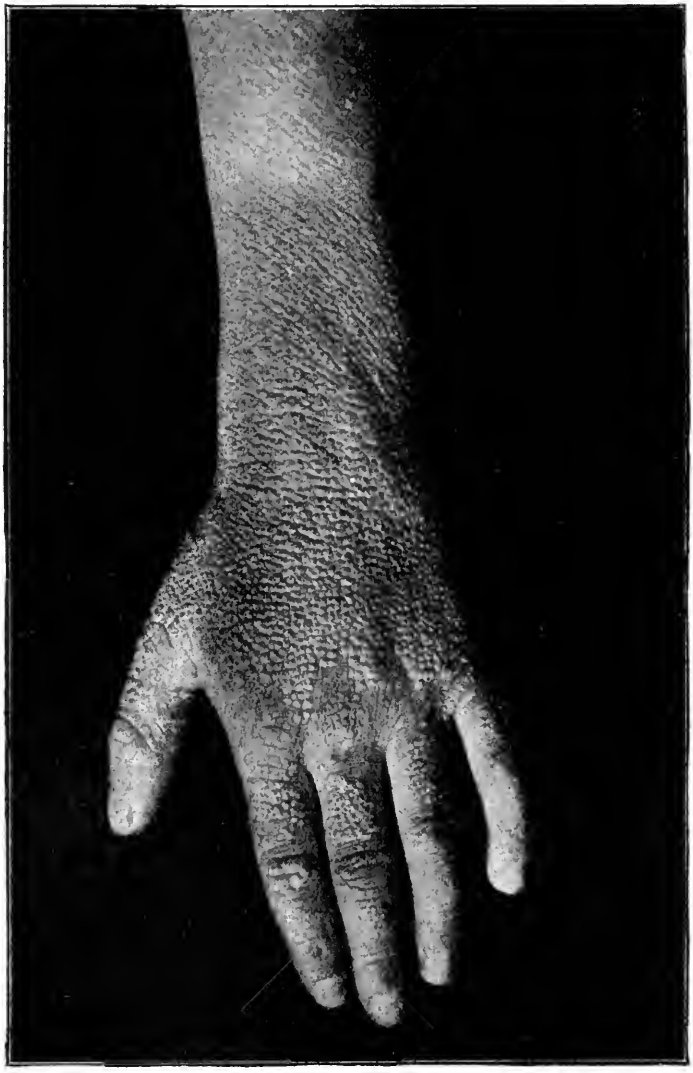

FIG. 74.—Pityriasis rubra pilaris. The horny follicular papule is here well shewn in one of its most characteristic distributions. (From the same case as Fig. 73, from a photograph kindly lent by Dr. A. Whitfield.)

majority of cases the disease persists for many years, generally with long periods of improvement, or even of apparent cure. It is difficult to follow the course of cases of this class, but there seems no doubt that

complete recovery may ultimately take place. Fatal cases, such as Hebra first described, are occasionally recorded, but they seem to be exceedingly rare.

**Diagnosis.**—In a well-developed case the features are so striking that there can be no difficulty in making a correct diagnosis; the thick scales on the scalp, the redness and fine scaling of the face, the hyperkeratosis with exfoliation and fissuring of the palms and soles, the large red scaly areas on the trunk, and, above all, the red horny papules around the hair follicles, especially upon the backs of the hands and fingers, together with the absence of any disturbance of the general health, make up a characteristic picture. The earlier observers had to draw distinctions between this disease and others with which it was at that time confused, such as psoriasis, ichthyosis, lichen planus, and pityriasis rubra, and although, now that the identity of the disease is so well established, there can seldom be confusion with such affections, there may be cases in which difficulty arises. For example, several cases have occurred in which at one period a generalised redness and scaling simulated pityriasis rubra. Occasionally the very unusual form of follicular psoriasis may simulate pityriasis rubra pilaris, or vice versa. Dr. A. Whitfield exhibited the case of a boy, aged $4\frac{1}{2}$ years, which when first shewn had many features suggesting psoriasis, the follicular papules having no central horny plug, but cup-like scales. Later, a condition undistinguishable from pityriasis rubra (dermatitis exfoliativa) developed, and, finally, when exhibited a second time, it was a characteristic example of pityriasis rubra pilaris. In the case of a little girl recently under my own care there were, first of all, a few typical scaly patches of psoriasis on the trunk and limbs, and then, suddenly, an outburst of red follicular lesions, each with a tiny silvery scale, picking out nearly every follicle in the body, so that had the early psoriasis lesions not been observed the case might easily have been mistaken for pityriasis rubra pilaris.

The eruption must not be confused with the acuminate type of lichen planus, which Dr. J. J. Pringle has called "plano-pilaris." The association of the plane papules with the acuminate follicular papules, and the absence of large sheets of redness with scaling, serve to distinguish this eruption from that of pityriasis rubra pilaris. The possibility of such confusion is perhaps a sufficient reason for discarding the name lichen acuminatus.

**Treatment.**—Richaud in 1877 said that the treatment of this disease had yet to be discovered, and little if any advance has been made since that time. There is no real cure for this complaint, but much may be done by local applications to relieve and even to remove the symptoms of an attack. Richaud recommended as local applications for the relief of the itching, and as best suiting those patients, glycerin of starch, or, better still, glycerin with 10 per cent of cherry laurel water. He also advocated alkaline and starch baths. Brocq, Taylor, and Morton were also favourably impressed by the effect of warm alkaline baths and local emollient applications. As regards internal treatment, a few writers have

recommended arsenic, but it is generally considered that it is unnecessary and that it may be harmful. Hebra attributed the cure of his later cases to the enormous doses of arsenic they received—as much as 1 grain a day; while his earlier cases, which were all fatal, had arsenic in comparatively small doses. Probably no one would now give arsenic in such doses, more especially as the disease, as we now know it, is not fatal, and does not impair the general health. Thyroid extract has been tried in a few cases with temporary improvement. The amelioration after tuberculin injections in Milian's case has already been noted (p. 342).

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# PSORIASIS

By H. G. BROOKE, M.B. Revised by J. M. H. MACLEOD, M.D.

**Definition.**—A well-marked disease of the skin of common occurrence. The lesions begin as minute scaly points in the epidermis, on a more or less reddened base, which increase or extend so as to form circumscribed scaly patches, or gyrate lines about areas of all sizes. It is chronic in course, and almost invariably tends to relapse.

**History.**—It is always difficult to recognise the diseases of the skin, as we now know them, from the descriptions given by ancient writers; but it seems highly probable that the leprosy "whiter than snow" from

which Naaman and Gehazi suffered was psoriasis. For our leprosy, even the whitened anaesthetic patches, could never merit so poetical a comparison; indeed, psoriasis is the only disease known to us now which could be so regarded. And Naaman at the time of his cure was strong and in active service, which again would tally better with psoriasis than with leprosy. However this may be, it is certain that there has been a long lasting confusion between these two affections.

Celsus distinctly describes our psoriasis as one of his four classes of impetigo; and a few lines farther on we can recognise the guttate variety of the disease under the name of ἀλφός, one of his three classes of vitiligo. From his time down to that of Willan we find the names Psora and Lepra applied loosely to all kinds of squamous diseases. Willan and Bateman in their *Atlas* (Plate VII.) give a representation and a clear description of psoriasis, which they speak of as "Lepra vulgaris, the common leprosy"; whilst under the heading Psoriasis, the second division of scaly diseases, we find easily recognisable pictures of P. vulgaris, acute and chronic eczema, seborrhoeic dermatitis, and P. gyrata. Willan restricted the name Lepra (Graecorum) to those eruptions which assumed circular forms, and applied to the rest the name Psora leprosa, or Psoriasis, to prevent a confusion with scabies, the psora (*nosos* understood, the itchy or scaly disease) of many earlier writers. Although the inutility of this division was pointed out by Alibert, Fuchs, Hebra, and others, and the danger therein of confusion with true leprosy (L. Arabum), the use of the two names was upheld by most of the prominent French and English writers during the first half of the nineteenth century, and even later. Erasmus Wilson revived the name Alphos; but, with this exception, all the more modern writers have used the name Psoriasis or P. vulgaris for all forms of the disease, and have reserved the word Lepra exclusively to denote the leprosy of the present day.

**Frequency.**—Crocker states that the proportion of psoriasis to other skin diseases in this country is 7 per cent; Nielsen, taking the mean of the combined statistics of several of the largest towns in Europe, found that the percentage was 6·5 per cent. In North America, J. C. White, by means of similar combined statistics from several large towns, estimated it at 3·28 per cent; and Bulkley, from his own large statistics, at 3·69 per cent. It would seem, therefore, that the malady is much more common in Europe than in America (North); it is also more often met with in France and England than in Germany and Austria.

**Etiology.**—*Age.*—Psoriasis may begin at almost any age, but it is rare for it to appear after fifty. I have seen a first attack in a woman over sixty, and have found the lesions well established in children between two and three years old. Twice I have been assured by mothers, who knew the disease, that their children had it directly after birth. Kaposi refers to one case in a child of eighteen months, whose father was psoriatic; Bulkley has met with five cases reported to have started during infancy; Rille reports a case in an infant five days old.

*Sex.*—The statistics of different observers vary too much in detail to

allow us to compare accurately the susceptibility of the two sexes, but they certainly shew definitely that men are affected more frequently than women,—in the ratio of about 3 : 2 ; and that the relative proportion of men is much larger after twenty years of age than before. Nielsen's (Copenhagen) and Bulkley's (New York) figures both coincide in this respect.

*Social rank* and *occupation* do not seem to have any effect on the liability to the disease. It is widely spread, but the influence of race upon its development has not been studied with care. It is common in northern latitudes (in Iceland 8 per cent of all skin diseases, including 50 per cent of scabies), and is rare in negroes (Morison) ; but, bearing in mind the action of vapour baths in accelerating the disappearance of the eruption, it is possible that climate may have more to do with the distribution than race.

Notwithstanding researches in every direction—social, statistical, chemical, microscopical, and bacteriological—the cause of psoriasis is still unknown. The disease may begin at almost any age ; it attacks both sexes, and those in all conditions of life, the well-to-do and the poor, the fat and the thin, the dark and the fair. Extensive analytical schedules (Bulkley, Schütz, Nielsen, and others) give no clue to the mode of selection of the victims ; the results of bacteriological investigations are discredited, and minute histological examinations have not determined with certainty the site in which the change begins. We are therefore reduced, if we wish to adopt some working hypothesis, to make a kind of eclectic review of the various opinions on the causation of the disease. These may be placed under three headings, namely, (i) the humoral, (ii) the neuropathic, and (iii) the microbic.

(i) The *humoral hypothesis*, as upheld by the older writers, explained psoriasis either as a manifestation or hanger-on of gout, or of what the French school called "herpetism" or "arthritism." Bulkley (6) quotes the opinions of Holland, Watson, Prout, and Sir A. B. Garrod as to the concurrence and alternation of this disease with gouty and rheumatic states, and says that "the evidence increases that it is more or less allied to the blood states which are known as gouty or rheumatic." The evidence, however, seems in many of the patients to consist in "an acid state of the blood" with deposits of uric acid, urates, oxalate of lime, and stellar phosphates ; and in the beneficial action of copious water-drinking, with abstention from alcohol and meat. Gout may undoubtedly irritate a psoriatic eruption, as it may a parasitic eczema, or a rhinitis, or an erythema ; but the attempt to establish a causal connexion between the gouty or rheumatic state and psoriasis has now been almost universally abandoned, yet not without the most careful consideration. And indeed any one who sees a large number of patients suffering from psoriasis, and looks at them with an unbiassed mind, would have to confess that any such explanation, even on the most liberal interpretation, could apply to but a very small minority of them.

The diathetic views of the older French writers, although still partially adhered to by some modern clinicians—even by Brocq,—have been

so thoroughly denounced by Besnier in the name of the St. Louis school as to render any further criticism unnecessary. Erasmus Wilson's notion, since revived by R. W. Taylor, that psoriasis is an attenuated form of hereditary syphilis, may be dismissed at once as untenable. Some years ago Wolff suggested that psoriasis is due to the action of a parasite which is probably ingested with the food, and thus entering the blood-stream finds its way to the skin and gives rise to the eruption. Tommasoli proposed that some bio-chemical ferment, generated in the body, produces the lesions on the skin; but both he and Wolff seem to have since abandoned their notions, which indeed had nothing in the shape of facts to support them.

(ii) *The neuropathic hypothesis* appears to have been originated definitely by Barduzzi and Weyl, although Tilbury Fox had already (1873) said that the trophic nerves seem to play a large part in psoriasis. Eulenburg stated that it is closely associated with a general neuropathic condition, and especially with such symptoms as hysteria, neurasthenia, and psychical overstrain. Weyl thought it most probable that psoriasis depends upon a congenital functional weakness of the nerve centre regulating the nutrition of the skin, and that the eruption is the peripheral expression of the central disturbance excited by irritations acting on certain hereditary lines.

At the present time the neuropathic hypothesis has a large body of adherents, who support it mainly in opposition to the parasitic; averring that the disease presents certain features incompatible with those of other dermatoses of known parasitic origin. The chief of these objections are that the disease is hereditary; that it is not contagious; that it cannot be inoculated; that it is seasonal; that, like urticaria, its appearance may be incited by local irritations or injuries; that it is symmetrical; that it may be induced by shock, grief, or anxiety; that it has sometimes a distinct connexion with asthma, and that it is incurable. But the argument on which most reliance has been placed to prove its nervous origin is the alleged frequency of its coexistence with other nervous symptoms, especially in very neurotic patients, and with various forms of arthropathies which are presumed to be of nervous origin.

The concurrence of psoriasis and certain forms of joint affections is not a new topic among French dermatologists. It was noticed by Alibert and Rayer, and described by Gibert and Cazenave; later still Devergie seriously discussed the nature of their connexion. The writers who in recent years have treated the subject most fully are Bourdillon, Polotebnoff, and Kuznitzky. Bourdillon records 33 cases, of which 27 were men and 6 women. He found that the arthropathies generally affect the small articulations of the limbs, especially those of the hand and wrist; they are slow in their course, are preceded by pain of a dull aching or lancinating character, are accompanied by little effusion, and soon tend to form contractures and ankylosis, but not tophi. They resemble most closely fibrous or rheumatoid arthritis, to which, however, they do not exactly correspond. Attacks, always painful, keep recurring

and lasting for months. The absence of morbid history, family or personal, and the negative results of anti-rheumatic treatment, forbid us to regard them as of rheumatic origin. They rarely precede the eruption of psoriasis, but follow it (29 times) at varying periods. They are also associated with very various nervous symptoms, such as neuralgias, melalgias, and myalgias; and they occur especially in persons of neurotic inheritances, and in those who have suffered from neuroses in their youth. In the absence of any other possible explanation Bourdillon therefore felt justified in regarding them as trophic in origin, and belonging to the group of nervous arthropathies.

Polotebnoff supports Bourdillon as to the characteristics of the joint lesions in psoriasis and their nervous origin, but dwells more especially upon the neurotic element in his psoriatic patients. He cites instances of members of neurotic families in whom the appearance or exacerbation of psoriasis ran parallel with various nervous symptoms, such as headaches, migraine, hysterical attacks, cramps, insomnia, epilepsy, various palsies and paraesthesias, and lunacy; in others the nerve symptoms and psoriasis were due to injuries received even six or eight years previously. On these observations he bases the opinion that psoriasis is one of the multiple symptoms of a vasomotor neurosis, in which the disturbances in the blood circulation, as they occur in the different organs of the body, sometimes extend to the skin. The result of his histological investigations satisfied him that the local lesions of psoriasis depend simply on a dilatation of the blood-vessels—an angioneurosis, on which the abnormal increase in the formation of epithelial scales is, either directly or indirectly, dependent. The scaling he regards as a simple exaggeration of the normal desquamative process.

Kuznitzky has gone much farther than his predecessors in the advocacy of the neurotic supposition, for he has not been content to speak merely of supposititious nerve-centres and simple hyperaemia, but has also attempted to define precisely the site and function of the centres concerned. He repudiates the dictum of Hebra that the subjects of psoriasis are generally healthy people; they are, on the contrary, persons who have inherited or acquired an irritable nervous system. Psoriasis itself is not inherited, but the disposition to it; and this proclivity consists in an abnormally irritable central nervous system. The rapid changes in the cutaneous phenomena and the occurrence of the eruption on one side of the body (one case of which he illustrates) shew that it is not a peripheral but a central neurosis; and, as it may concern all the vasomotor centres, it must be the whole cord which is affected and not the medulla oblongata only (Goltz). The arthropathies are apparently neither gouty nor rheumatic, but in all probability co-ordinate with the psoriasis and due to the same cause; this supposition is supported by the supervention of changes in the peripheral skin, muscles, and bones after artificially produced chronic irritation of nerves, especially when the areas supplied by these nerves have been subjected to injury or even to simple pressure (as in walking). He quotes the case of Pel's patient,

who at the end of every summer for thirty years presented the most perfect picture of advanced lateral sclerosis combined with a general eruption of psoriasis; in the spring both always disappeared synchronously, and the man remained perfectly well until the next summer, when both affections returned again. It is well established that psoriasis may appear directly after some psychical shock or strain, as it has been proved anatomically that shock may cause myelitis; moreover, psoriasis may disappear spontaneously in a very short time. In the pathology the chief factor is the hyperaemia, which is neither inflammatory nor paretic, but angio-erethic, due to an irritation of the vaso-dilators. The chronically irritated state of the spinal vasomotor ganglia is probably only functional, and may quite possibly be caused by injuries, even of the slightest kind, acting on the vascular areas supplied by the excited ganglia; but it is also probable that more permanent material lesions of the grey matter of the cord exist, which have not been described as yet; perhaps because search has not been made for them in necropsies on patients who have suffered from psoriasis.

(iii) *The parasitic hypothesis* owes its origin to Lang of Vienna. He drew attention to the close resemblance of the rings and gyrate figures of the psoriatic eruptions to those produced by the dermatomycoses, and of the discoid plaques to the diffuse spread of pityriasis versicolor. In both cases the alternation of quiescence of the eruption with exacerbations and extension could, he thought, be explained by alterations in the nutrient base and consequent slower or quicker vegetation of the fungus. The gyrate figures, formed when the centres of the rings meet, would be due to the exhaustion of the food on the surface already covered. The preference for the extensor surfaces, and especially for the elbows and knees, is possibly due to the greater friction exercised by the clothing on those parts; but more probably to some anatomical or physiological difference which makes them more accessible or more suitable to the parasite. Favus, like psoriasis, affects the extensor surfaces, whilst tinea prefers the finer flexor surfaces. He also instances the similarity of the affections of the nails in the two classes of disease, and the absence of any manifestations on the mucous membranes; and he urges that the absence of any proof of a connexion between psoriasis and a pathological change of any internal organ shews it to be a local and not a constitutional disease.

The heredity which occurs, in different estimates, in from 3 to 20 per cent of all cases, Lang explains as an hereditary disposition of the skin to allow of the growth of the supposed parasite; and with our present knowledge of the fastidiousness of certain organisms as to the nature of their nutrient media, the explanation is quite feasible. For different individuals have been found to vary greatly, both clinically and experimentally, in their susceptibility to parasitic diseases. But until a parasite has been definitely detected it is, of course, manifestly impossible to say whether the heredity be merely one of disposition, as in tuberculosis or eczema, or of the disease itself, as may occur in bullous dermatolysis and certain neuro-vascular affections.

That the disease is not inoculable is in the main true. Many trials have been made by different experimenters (Lassar, Tommasoli, de Amicis, Ducrey, Campana, and others) both on men and animals; and, although in some of the animals a squamous condition of the skin was produced, none of them succeeded in producing in man any results whatever, not even when the tender sub-scalar membrane was rubbed or inserted into the living epidermic cells, or blood injected, or pieces of psoriatic skin directly transplanted. Of all the numerous experiments which, from the time of Alibert, have been made on human beings one only seems to have been successful, that of Destot, who established a typical psoriasis patch on the elbow fourteen days after inoculating psoriasis scales on the fore-arm; yet even here the eruption did not appear at the site of inoculation. Recently Schamberg carried out a series of auto-inoculation experiments in psoriasis patients, with the object of refuting the suggestion that the reason why inoculation experiments had been negative was that the necessary disposition is absent in the individual inoculated. In three out of twenty-three attempted inoculations he succeeded in the artificial production of psoriasis lesions on the site of the inoculation; but these were all cases in which there was a marked tendency to the development of new efflorescences and in which the new lesions were easily explicable as the result of trauma. In the other cases in which the eruption was circumscribed and stationary, he found it impossible to induce new lesions by artificial means. These repeatedly negative experiences look decisive enough; but, as Lang points out, repeated attempts have been made to inoculate tinea versicolor, of the fungous nature of which there is not the slightest doubt, yet so far not more than two successful cases have been recorded.

Notwithstanding the failure of these artificial attempts, it is open to doubt whether a good deal of the apparent heredity may not be a direct transmission from one member of a disposed family to another, for which the intimacy of the common life would give endless opportunities. Nielsen quotes a case in which a mother acquired the disease a long time after her daughter; and I have a case in which a mother manifested psoriasis for the first time not long after she had begun to sleep by night in the bed which her son, who had long suffered from psoriasis, occupied during the day. Campbell also met with two cases in which mothers acquired the disease four years and one year respectively after their sons. It has been objected that the disease is not communicable between persons who are not related but live in close contact. Usually this is so, but it is not invariable. Unna has recorded a case in which a nurse-girl suffering from psoriasis communicated the disease to three children who were perfectly free from any hereditary taint; and Nielsen has seen a similar transmission. Augagneur had a patient, suffering from a trade eczema, in whom the eczematous surfaces became the starting-point of a general psoriasis after he had occupied a bed between psoriatic neighbours. Poor mentions 5 cases, and Nielsen 1 case, in which both husband and wife were psoriatic; and Hammar, McCall Anderson, and Aubert have met

with cases in which the husband manifested psoriasis after living with a psoriatic wife.

Another reason which has been advanced against the parasitic hypothesis is the possibility of a patch arising on the site of an injury to the skin, such as a scratch or prick or wound; or even after the use of poultices or compresses on parts which have been irritated by chemicals or caustics: for it has been argued that such a mode of invasion likens it to urticaria, or to other angioneuroses or trophoneuroses of reflex origin. But when patches have been intentionally produced in psoriatic patients, by scratching through the most superficial layers of epidermis with a needle (Koebner's experiment), it is found that the experiment only succeeds when the disease is in the progressive stage; that it never appears until after a lapse of about a week, and then in the form of minute discrete puncta, which suggest much more strongly the growth of a microbe which has fallen on a nutrient base than a reflex neurosis. The casual outbreak of a primary psoriasis on the site of some local injury is quite as easily explicable by the supposition of a local parasitic infection as by that of a constitutional bias.

The symmetry of psoriasis is not well marked in the great majority of cases; indeed, it is not usual, unless the disease is very extensive or is spreading quickly. Too much stress has been laid upon this point as an argument in favour of the neurotic origin, for, as Lang has pointed out, psoriasis is not by any means so symmetrical in its arrangements as scabies or tinea versicolor, or even as pityriasis rosea. Its symmetrical extension may be preceded by an erythematous or even an urticarial outbreak; but lupus vulgaris may spread rapidly and symmetrically on the face in the wake of an erythematous rash, and disseminated lupus is at times symmetrical in a well-marked degree. The most that a symmetrical distribution could prove would be that (putting aside the mere symmetry of favourite anatomical localisations) nerve influence can determine the site of an eruption of psoriasis as it may of an eczema.

It is true that psoriasis has sometimes a definite association with asthma, the attacks being either concurrent or alternate (Bateman, Bulkley, Hölscher, and others). But this proves nothing as to the neurotic nature of psoriasis; it only shews that, like patches of eczema or rhinitis, it may serve at times either as an excitant of the asthmatic neurosis or as a counter-irritant.

Crocker has brought forward an argument against the parasitic hypothesis, that the disease is apt to recur in disposed subjects whensoever they come under depressing or debilitating influences, and decreases rapidly when such influences are withdrawn. Apart from the well-known fact that psoriasis may seem to disappear, even for long periods, after exhausting fevers, the same influences are found to act in the same way in various affections of the skin undoubtedly parasitic; for example, sycosis, seborrhoeic dermatitis, or parasitic eczemas, which may vary greatly with the general state of the health. The supposition that the skin varies in its susceptibility to the action of a parasite at different times would explain the

liability to fresh outbreaks, and the periodicity of certain cases, just as easily as that of a neuro-vascular influence; and there is no reason for supposing that such variations in susceptibility occur less frequently in the skin than in other organs, as, for example, the lungs and intestines. We need only allow that if psoriasis be due to the action of a parasite, this parasite is a fastidious feeder, and that the skin must be in a specially prepared state to allow of its growth.

After this brief statement of the arguments which have been used for and against the parasitic and nervous hypotheses, it is not difficult to see defects in both. Those in favour of the nervous origin of the disease have received but little attention as yet in this country; and the novelty of a view which would convert our psoriatics, whom we have for so long regarded as among the healthiest of our patients, into a class of neurotics and cripples, is certain to be received by us with great caution, if not with opposition.

Let us take first the case of the arthropathies. Their connexion with psoriasis is not a common one. Schütz found one case in a hundred; Besnier estimates the proportion roughly at 5 per cent; and Nielsen, from careful statistics of his 616 cases, at about the same. In this country it is certainly very uncommon. In some hundreds of cases of psoriasis I have hardly met with a single case of a marked joint affection, although I have been on the look-out for them; and I have certainly never had one among those worst cases which have had to be taken into the wards. The authors of the English textbooks make no mention of the relationship, except Sir Malcolm Morris, who says that he has never observed it. Crocker merely says that gout, rheumatism, and rheumatoid arthritis exercise an influence over psoriasis. A case was reported of psoriasis with rheumatism which passed over into pityriasis rubra (Dyce Duckworth); and Sir Stephen Mackenzie shewed two cases of psoriasis of the nails associated with "end-joint rheumatism." Following on the psoriasis the terminal joints of the fingers and some of the toes became red and swollen. In one case the only fingers affected on each hand were those on which the nails were psoriatic. The affection was an osteo-arthritis. Nielsen notes that most of the cases are chronic forms of joint disease (rheumatism and arthritis deformans), which shew no relation to the psoriasis in their date of origin or their extent, and generally none in their exacerbations. He finds that psoriasis occurring in persons suffering from such lesions runs with unusual frequency up to a very high degree of intensity, and often takes on the character of dermatitis exfoliativa or psoriasis inveterata, but denies any community of cause between the two affections. Whilst granting that many of the cases are merely simple coincidences, he is wrong in ignoring the opinion of other good observers that the connexion may be an intimate one. Kaposi speaks of rheumatoid articular pains as habitually accompanying the acute eruptions; and Besnier insists that the cases are not merely instances of psoriasis in the rheumatic subject, or of rheumatism in the psoriatic, but of a pathological unity—"psoriasis arthropathique."

Whether or not it be due to a difference of temperament of the people in this country it is hard to say, but we certainly have not noted any marked connexion between psoriasis and psychical excitability. Such facts as its connexion with functional paraplegia, its sequence on attacks of neuralgia and sciatica (Besnier and others), and the limitation of the eruption to areas supplied by the nerves involved in these neuralgic affections (Thibierge), prove that some morbid nervous influence may be in action. But a less intense form of nervous excitability is required for the majority of our psoriatic patients, and a more refined and special kind of spinal irritability, before an opinion like that of Kuznitzky can find a general acceptance, for most of them do not shew any nervous symptoms either in themselves or in their families; nor can they connect their outbreaks with any appreciable alteration of their usual good health.

Neither of the hypotheses alone seems as yet to be capable of explaining all the phenomena of the disease. The parasitic view fails to explain, even as satisfactorily as the other, why eruptions should be produced by shock or physical depression, and heal either spontaneously, or merely by the help of invigorating external conditions (such as sea-bathing); and it is powerless to account for the relationship between the skin lesions and the arthropathies and general nervous symptoms. On the other hand, the neurotic hypothesis has nothing on which to base its assumption that the lesions in the skin are simply the result of a chronic hyperaemia; and there is no analogy among the nervous dermatoses to support the opinion that the peculiar form of parakeratosis found in psoriasis is due to nerve action alone.

Besnier no doubt felt this difficulty when he suggested that the trophic disturbance depends "on that part of the medulla which is the centre for the function of keratinisation," a centre not as yet discovered. The clinical character and pathological anatomy of the lesions are more readily explained by the supposition of a parasite located in the epidermis. And the neuro-vascular view, although it may allow us to understand the cause of the relapses and spontaneous disappearances of the eruption, fails to account for the success of an antiparasitic treatment. There is no analogy among the erythematous diseases of the skin to explain why eruptions which have been present in varying degree, but continuously, for long periods of time may be cleared away by local antiparasitic treatment alone in a few weeks, and may remain clear for months or even years afterwards, though the nerve symptoms continue; nor why a continued after-treatment may have so well-marked an action in restraining or even preventing relapses.

There is nothing improbable in the supposition that both the internal and external causes are at work at the same time, as Crocker (though on different grounds) has already suggested; the neuro-vascular factor being primary, and the parasitic being secondary but essential to the full manifestations of the lesions. Such a combination has already been supposed to occur in sebaceous rosacea, in lupus erythematosus, and in certain forms of eczema, such as the chronic centrifugal circinate or discoid patches

and the acute eczema of dentition in seborrhoeic children—all of which may require a local antiparasitic treatment to remove what was primarily an angioneurotic condition. This view is a compromise, it is true, and will probably be replaced, after further investigations, by some more accurate and satisfactory explanation; but at the present it seems to be the only working hypothesis of which our knowledge will admit.

**Pathology.**—The discrepancies in the statements of different investigators of the morbid anatomy of psoriasis are doubtless due to the differences in the lesions from which their specimens were obtained. It is, for example, rarely mentioned whether the sections were taken from a fresh eruption or from one of long standing; or whether the disease was at the time stationary or spreading; nor is it recorded from what part of the body they were taken, a most important point considering the normal differences in the structure and growth of the skin in different regions. The want of care in eliminating accidental details, or such as are common to other diseases, has also helped to increase the confusion; and the mental bias towards one or other etiological hypothesis has, in some instances, obviously led to the exaggeration of certain features and to the neglect of others.

Three changes are, however, described by all the more recent writers as constantly present — (i) an increased production of epithelium; (ii) a change in the character of the epithelium; (iii) a dilatation of the vessels. It has long been recognised clinically that the most minute lesions of psoriasis are indicated by hyperaemic spots which give characteristic scales when their surface is slightly scratched. Whether the scales may appear before the redness it is difficult to say, for they are not always recognisable by the eye alone, even with the guidance of the vascular redness beneath; and whenever examined microscopically the vascular changes are always found to accompany the scaling.

Thus, Polotebnoff, by denying the existence of any cell-exudation, and by ignoring the qualitative changes in the horning process, is enabled to interpret the incipient redness, and the underlying dilatation of the papillary vessels which causes it, as a proof of the angioneurotic nature of the disease. Hebra and his school also regard the redness as primary, but construe it as an early symptom of an inflammation of the cutis to which the epidermic changes are consequent. On the other hand, those who hold that the first sign of the lesion may be a papule without redness — that is, that the scaling may precede the redness— naturally look upon the epidermis as the primary seat of the disease. Thus Wertheim (1862) attributed the redness to a secondary hyperaemia, whether a congestive hyperaemia or a stasis, due to some persistent though unknown form of irritation. Unna holds that the scaling is always immediately antecedent to the redness, as indeed it would have to be (whether clinically demonstrable or not) to accord with the view that the disease originates in the epidermis. Squamous affections of the epidermis, similar to psoriasis, do exist without apparent vascular dilatation; but, when we consider the very close interdependence of the epidermis and

the vessels of the upper layer of the corium, it is not surprising that in a disease in which the changes are so rapid and extensive as those in psoriasis the two should be affected almost synchronously. It suggests rather that one cause is producing changes in the vessels and epidermis alike, than that the changes in either area are a by-product of the other. It will be better, however, to consider the alterations of the two layers separately.

*Changes in the Epidermis.*—The clinical character of the scales has been sufficiently described above, and we have now to consider the pathological characters of the change in the horning process which leads to their production, since these have an important bearing on the question of the causation of the disease.

Tilbury Fox, Robinson, Jamieson, Auspitz, Thin, and Hans v. Hebra have all contended that the primary seat of psoriasis is in the epidermis. Auspitz classified it as a parakeratosis, that is, an abnormal form of cornification. The normal epidermic cell consists of two parts: (*a*) a spongy skeleton composed of a dense mass of fibrillae (or spongioplasm); and (*b*) in the meshes between the fibrillae a semi-fluid protoplasm (or hyaloplasm). In a clear space in the centre lies the nucleus, while the spongioplasm is condensed at the periphery of the cell to form a cell-membrane. On the outer side of the membrane the fibrillae project like spines and unite with similar processes from neighbouring cells to bridge over the intercellular spaces, and hold the whole layer together. As the cells pass upwards their protoplasm degenerates, keratohyaline granules appear, their intercellular processes shrivel, and they become more or less flattened to form the granular layer. Immediately above this a further stage in the evolution of the cell is reached in which the granular contents are replaced by an oily substance called eleidin and the cell becomes swollen out into an irregular polygonal shape. A further development then occurs with the formation of a horn cell, and the process of cornification is complete. The typical horn cell is a flattened cell in which the periphery has become keratinised, the nucleus has disappeared, and which contains a varying quantity of a waxy substance.

In a parakeratosis, such as psoriasis, this process is imperfectly carried out. The keratohyaline is not formed (Suchard), and the stratum granulosum is therefore absent. During periods of diminished activity of the morbid action, the granular layer may appear in its normal thickness (Vidal and Leloir), or during attempts at healing may be greatly increased (Neumann). It is the absence of the refracting granules of keratohyaline which allows the red colour of the plaques to be seen so clearly when the scales are removed (Leloir). The nucleus and protoplasm do not disappear so completely as they do in the normal skin; and the cornification process being imperfect, and the cell-mantle thus still permeable, they soak up fluid and keep the cell soft and pliable. The intercellular bridges do not become hard and break apart; thus the horny cells, instead of being cast off singly, as in the normal skin, are held together in large flakes. The moisture prevents the absorption of the skin fat; thus, when these flakes are lifted up so that the air can penetrate under

them and dry them, they become highly refractive, and take on their characteristic white glistening appearance. The abundance of mitoses in the cells of the lower layers of the epidermis (palisade cells, but chiefly in the prickle cells immediately overlying them) is evidence of their unusually rapid proliferation.

The papillae, in well-developed lesions, are often enormously elongated, and this elongation Neumann attributed to a new growth of the papillae themselves. Auspitz pointed out that it is not the papillae which grow, but the epidermis; and that the new growth of epidermic cells, taking the line of least resistance, stretches downward between the papillae into the corium, so forcibly elongating the papillae and producing the effect illustrated in Neumann's figures. This explanation is borne out by Kromayer, who found that the increase in the size of the papillae was most marked in lesions taken from the back and neck, where normally they are very slightly developed. And the elongation is by no means peculiar to psoriasis, but may be seen in any keratosis (such as callosities or corns) in which there is an increased growth of the epithelial layer on a circumscribed area; and also in lupus, syphilis, pityriasis rosea, seborrhoea, and other chronic inflammatory diseases of the skin. An increase in the size of the papillae may take place owing to the pressure of dilated vessels and oedema, and to the increase of their cellular contents; but this is a simple deformity, and not an active enlargement (Unna). Kromayer insists that both papillae and epidermis must necessarily take part in the growth, for, as in his opinion the epidermis and papillary body form respectively the parenchyma and stroma of one organ, it is impossible for one element to grow without the participation of the other.

*Changes in the Blood-vessels.* — Examination of one of the earliest diagnosable lesions of psoriasis shews that the vessels of the superficial layer, and those forming the papillary loops, are already slightly enlarged and elongated, and are surrounded by an infiltration of cells. This infiltration varies in amount, according to the acuteness, intensity, and duration of the eruption. The younger and more active it is, the greater the cellular infiltration. This infiltration consists of small mononuclear cells like lymphocytes, and a varying number of polynuclear leucocytes. The polynuclear cells Kromayer regards as identical with Ehrlich's neutrophil blood-cells, and Unna considers that they are not a part of the pure psoriatic process, but are an evidence of eczematisation. The origin of the mononuclear cells is uncertain. Unna regards them as connective-tissue cells derived from the fixed tissues; but the possibility of determining whether inflammatory infiltration cells are mononuclear leucocytes or take their origin from connective-tissue cells, presents certain difficulties, as their morphology and staining reactions are practically identical. It would seem most probable that the mononuclear cells are partly lymphocytes, and partly derived from the endothelium and from the connective-tissue cells in the immediate neighbourhood of dilated blood-vessels. The loop of vessels in the papillae is not only increased in calibre but is also lengthened and contorted. Kromayer thinks that

this alteration is merely artificially produced by the shrinkage following excision, and says that it is found more or less in sections of normal skin; but although the loops are certainly often contorted, they are undoubtedly increased at the same time, both in length and breadth, in comparison with the neighbouring vessels in the normal skin close by. Wertheim, who first described the hypertrophy of these loops, attributed it to a stasis caused by some unknown impediment to the circulation. Unna agrees with him as to the existence of a stasis, for he finds, from the examination of carefully injected specimens, that the venous legs of the loop, and indeed the venous capillaries of the whole of the superficial vascular network, are distended and lengthened; but he attributes this not to any direct impediment to the circulation but to a chemiotactic action from the side of the epidermis which, by its continuous attraction, first lengthens the blood-vessels and then passively dilates them.

The amount of cell-infiltration is usually slight, and confined to the immediate neighbourhood of the uppermost layer of vessels. It may, however, affect these lying beneath the papillary layer, and especially those which supply the sweat glands and their ducts; so that the lumen of the glands may be blocked up. Crocker found a free infiltration around the hair follicles, which extended even down to the roots in the deeper layers of the corium; and, combined with this, a proliferation of the epithelium of the follicular walls with the formation of finger-like elongations. So deep an infiltration must be unusual, especially in early lesions such as he described; for almost all the other writers are unanimous in stating that the infiltration is ordinarily confined to the upper vascular layers, and that the deeper parts of the corium are but slightly affected in lesions of old standing.

No one has as yet discovered any changes in the sebaceous glands or their vascular supply; and Rindfleisch alone has described a perineuritis as occurring in one case. Others (Vidal and Leloir, Neumann, Kromayer, and even Polotebnoff) have failed to find any alteration in the nerves supplying the affected regions.

The evidence of the presence of oedema is conflicting. Auspitz denies it, and it is difficult to recognise when present in very slight degree. On the other hand, Crocker and Unna have found it among the very earliest changes in incipient lesions.

The question whether psoriasis be an inflammatory disease depends of course on the definition of inflammation. There is no heat nor pain, it never suppurates, nor does it form granulations or scars; yet we have, though only in small degree it is true, dilatation of vessels with oedema, and the presence of leucocytes around them betokening the response of the tissues to an irritation. Even some of the opponents of its inflammatory nature recognised this; for the elder Hebra said that the tissue changes are "comparable to inflammation," and Kromayer admitted that, although the clinical characters, in his estimation, are not those of inflammation, the histological characters might well be "likened to inflammation."

The hypothesis of *chemiotaxis*, propounded by Pfeiffer and Leber (1888), first suggested how irritants situated at a distance could excite these reactions by attractive force; and Unna, applying the principle to the skin, shewed that it is capable of explaining how microbes, situated in the outer layers of the moist epidermic cells, may attract leucocytes, impede the blood by so doing, and thus cause the vessels to dilate. It is quite obvious that a presumptive parasite may be situated in the epidermis in psoriasis, and cause at once an inflammatory hyperaemia of the nearest blood-vessels, even before it had had time to injure the cells immediately around it. In psoriasis this explanation is still but a speculation, for the micrococci, to which Unna attributes the irritant action, have too much the characters of saprophytes to allow us to consider them as specific agents.

**Relation of Psoriasis to Other Diseases.**—Beyond the gouty state (including the results of overfeeding with meat and alcohol) and certain arthropathies referred to on p. 356, there seems to be no form of disease, debility, or dyscrasia which necessarily exerts any influence on the course of psoriasis. Wasting diseases, such as cancer, diabetes, and phthisis, have caused it to disappear, but more frequently they leave it unaffected. It is not dependent on chlorosis; indeed, many aver that it increases as chlorosis disappears. Its coexistence with the most various forms of nerve lesions Polotebnoff has, unwittingly but conclusively, proved to be a mere coincidence.

It may be present in combination with other forms of skin affections, such as seborrhœa, eczema, syphilis, ichthyosis, and prurigo; and I have seen it in conjunction with lichen planus. Several cases are known in which epithelioma had developed on old psoriasis patches; and de Amicis and Pick have found mycosis fungoides starting in a like way.

That psoriasis has first appeared after attacks of scarlatina has been several times recorded, and has happened at least twice in my own experience; it has also been found as a sequel of the eruptions of other infectious fevers, such as erysipelas and small-pox. The initiation is presumably one of the remarkable changes in the nutrition of the tissues which follow these diseases, and is not due to the eruptions themselves; for several writers have noted its supervention after enteric fever.

Still more curious and suggestive is the origin of psoriasis on the site of vaccination, which has been recorded by several writers (Rohé, Hyde, Piffard, Chambard, Gaskoin, Morris, Fox); for it has occurred not only when the relatives were psoriatic, but also when there was no psoriasis in the patient's family, and no apparent source of contagion. Most of the cases were inoculated with animal lymph; and although it has generally arisen after the fall of the crust, it has done so where bovine lymph had been inoculated and had not taken (Rohé, Piffard, Hyde). From the time of Jenner downwards, eczematous outbreaks have been described as following vaccine inoculation, and it has also been often noted that the inoculation had removed existing eczematous eruptions; Wood had a case in which vaccination with bovine lymph removed

an extensive psoriasis from a young man; whilst two of his young sisters, for whom the same stock of lymph was used, both acquired the disease at the site of inoculation. The latter cases recall the origin of impetigo and tinea from the vesicles formed by animal lymph; but the former is difficult to explain, unless by a systemic influence upon the nature of the whole integument. A similar reaction is found in regard to pregnancy; for whereas some patients lose their psoriasis during their period of gestation, in others it is uninfluenced or even increased in amount.

**Symptoms.**—The eruption begins in the form of a minute point or papule of about the size of a pin's head, from which, in its earliest stage, a scale can easily be removed. Kaposi states that the red spot is not covered with scales until after a lapse of several days, but a scale can be readily obtained by scratching slightly as soon as the redness is discernible; if not visible to the naked eye, it can be detected by using a lens (Besnier). The redness is not ordinarily so bright as that of an acutely inflammatory disease, such as scarlatina or papular eczema, but is of a dullish or even reddish-brown tinge. The scale when detached is bright and dry, and from the first is generally white and even silvery in colour, or looks like mother-of-pearl.

The removal of the scale discloses a fine membrane covering the whole of the underlying patch. It is bright, but never oozes, and is so transparent that the colour of the blood-vessels is well transmitted through it. Bulkley, who first described this feature, rightly considered it as peculiar to psoriasis.

If this membrane be gently scratched away the surface will be covered by minute bleeding points. The bleeding soon stops, and in a day or two, or even in a few hours, the scale is reproduced. The production of these bleeding points, which are caused by the abrasion of the tops of the enlarged and elongated vascular loops in the papillae, was pointed out by Devergie, and by Hebra also, as being a useful differential sign. Although it cannot be considered as pathognomonic, for it occurs also in warts, it is certainly quite conclusive with regard to syphilis, the disease which most nearly resembles psoriasis, and with which there is the greatest danger of confusion.

As the spot enlarges by spreading outwards at its edge, it often becomes very slightly raised above the surface, and the scaling is more marked. The borders are then seen to be sharply separated from the surrounding skin, marking the patch out with a decisive contour; but they are never raised above the level of the rest of the patch, as is the case in the circinate erythemas.

Various adjectives have been used to denote the size and manner of growth of the individual lesions; and so long as they are used clearly for convenience of description, and not to indicate any differences in the character of the disease, they have a certain utility. Thus the earliest stage, when the disease appears as a dot, is spoken of as *psoriasis punctata*; the second, when it resembles a drop of fluid, or rather of mortar, upon the

skin, as *P. guttata.* As the lesions extend and form round patches of the size of small coins the term *P. nummularis* is used; and if the patches, whilst extending actively at the periphery, are clear in the centre, it is called *P. circinata.* If several such circles meet they form a large irregular circle, or a curved figure, having a polycyclic outline, and we then have *P. gyrata* or *figurata.* If the patches do not clear in the centre, as is usually the case, but coalesce to form larger plaques, the condition has been spoken of as *P. discoides*; and when this condition affects large areas, as *P. diffusa* or *scutata.* McCall Anderson described as *P. rupioides* a form of the eruption in which, on spots intermediate in size between the guttate and nummular, the scales accumulate in the shape of limpet shells, like those of the rupia of syphilis.

*Course.*—After having reached a certain size, usually between that of a florin and that of the palm, the patches cease to extend, and sooner or later begin to fade. Either they fade gradually over their whole area at one time, or white patches appear at different parts and coalesce, or the restoration begins at the centre and spreads outwards until the disease is entirely replaced by normal skin. If this restoration occurs as the disease extends, a circinate figure is formed; or, if the progress is one-sided, an arc of a circle. The ground over which these lines of disease have passed is, as it were, exhausted; and when two circles meet, the arcs between the points of contact disappear, and a single waving or cyclical line results, which continues the progress onward over the normal skin.

The return to the normal is complete so far as regards the infiltration and desquamation, but occasionally pigmentation remains when the patches have disappeared. It is usually slight and transitory, though Crocker and Neumann report cases of deep and permanent brown discoloration (*P. nigricans*). Staining of the sites of the lesions is not uncommon after the administration of arsenic, but it then usually occurs elsewhere at the same time. Achromia (Hallopeau) must be very rare, except as a result of the use of chrysarobin.

*Distribution.*—Though no part of the outer skin is exempt, the sites of predilection are the extensor surfaces of the limbs and the scalp; after these the lumbar and gluteal regions.

The primary lesion may occur anywhere, though I have never happened to meet with a case in which the face was attacked first. Ordinarily the earliest manifestation is found on the extensor surface of one of the limbs, and generally on the forearm or lower leg; in most cases before long the rough corrugated skin over the elbows and knees is attacked. In old-standing cases patches may be found on all four joints, but in those which are less extensive this symmetrical distribution is not so common. Far too much reliance has been placed upon the implication of these regions as a diagnostic symptom, for not only, when the disease is spread over the rest of the body, may they be entirely free, but they are liable to be the seat of other diseases, such as lichen planus, chronic eczema, and syphilis, which to an inexperienced eye may be indistinguishable

from psoriasis. In some chronic cases the patches on the elbows and knees constitute the only remaining signs of the disease; and there they may remain, seemingly unchanged, for years.

On the scalp the patches are usually small (nummular), and not so clearly marked out as on the body; they scale more freely than other affections, and the intervening skin is healthy. They may unite to form a cap of dense scales held together by the hairs, and yet the growth of the hair is for the most part wonderfully little interfered with by the disease. These patches must not be confused with the similar, often sharply circumscribed, masses of thick white scales apparently of seborrhoeic origin. They can be distinguished by breaking up the mass with forceps, when it will be found that the scales in psoriasis are horizontal, but those in the seborrhoeic affection vertical, forming long sheaths round each hair. The patches of psoriasis on the scalp are often pale, but they assume the red colour as soon as they pass out on the open skin. When combined with seborrhoea the scaling is more diffuse, and the eruption, if it extend to the skin of the face or neck, may appear as a bright red band with a festooned edge.

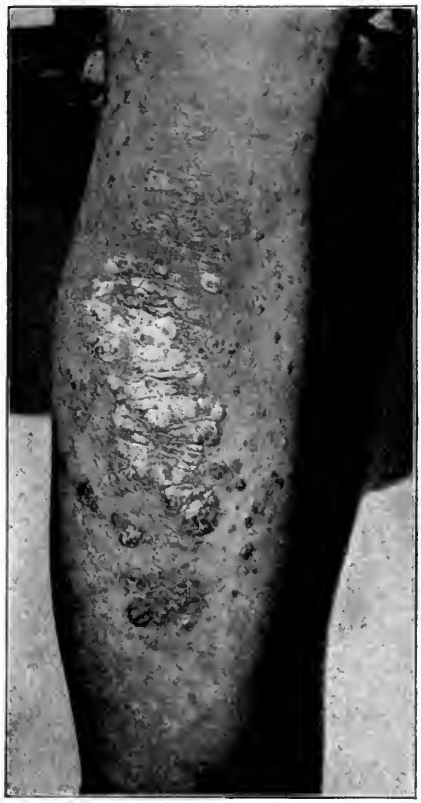

Fig. 75.—Psoriasis of the elbow.

On the face the lesions are rarely pronounced, and are at times difficult to distinguish from other scaly affections. They are mostly guttate and nummular, and sometimes gyrate. Behind the ears the patches are often well marked; they tend to crack and to become excoriated, and may be then easily mistaken for eczema. The concha and external meatus are frequently affected.

In the axillary and cruro-genital folds, and anal fissure, the lesions are very prone to macerate and to lose all their scales; it is then sometimes impossible to distinguish them from syphilitic condyloma, or from seborrhoeic eczema; so likewise on the scrotum, where the skin easily cracks, and becomes acutely inflamed. A dry gyrate psoriasis of the scrotum is practically indistinguishable from a gyrate syphilide. I

have seen two cases in which psoriasis existed for months on the scrotum alone before the appearance of any lesions elsewhere; in this case the diagnosis could only be inferred from the healing effects of tarry applications.

The disease may occur on the palms and soles alone, but this is exceedingly rare; indeed, even in widespread attacks these are infrequent

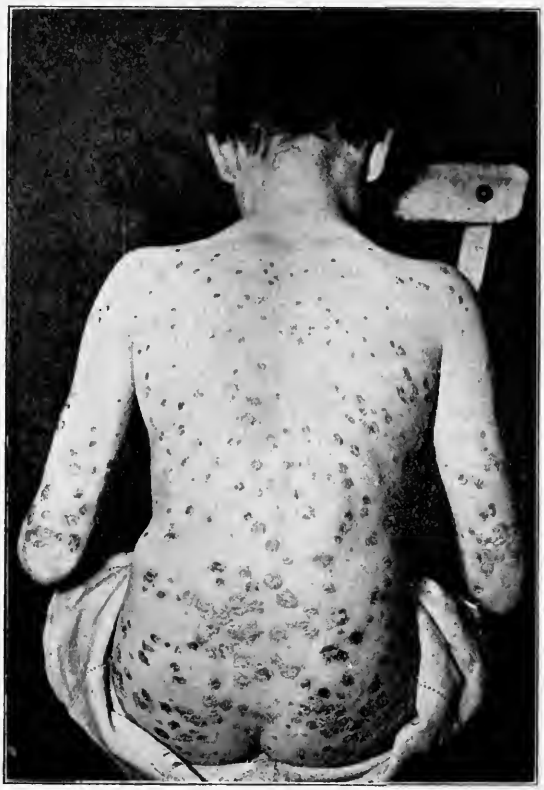

FIG. 76.—Psoriasis. (T. Colcott Fox.)

sites. The patches are irregular, and the scaling is replaced by rough exfoliation of hard dry skin, leaving a red base exposed beneath. Crocker saw one case of slight scaling of the ordinary kind. If the skin be abnormally thick, especially about the sole and heel, small plugs of horny epidermis can be picked out, leaving pits behind.

Affections of the nails are by no means infrequent in psoriasis, and observers who have given special attention to this point find that they are present, in some degree, in about 20 per cent of all cases.

The mildest and also the most frequent of the lesions are the punctiform pittings on the surface of the nail plate; these may be perfectly

smooth and the rest of the nail may retain its polish intact. Schütz describes this as *Tüpfelpsoriasis*, Besnier as *état pointillé*. The former observer has noticed in these cases a number of minute red spots on the lunule, under the covering fold of skin, which disappear momentarily under pressure. Unna attributes the pits to a transitory psoriatic affection

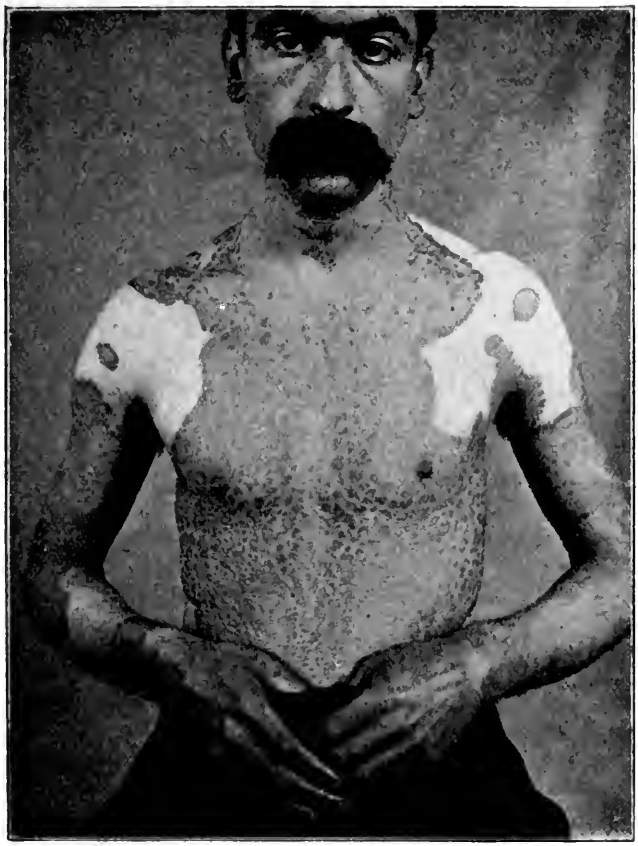

FIG. 77.—Psoriasis. (T. Colcott Fox.)

of certain of the papillae of the nail matrix, leading to a corresponding stoppage in the proliferation of the nail substance. To such a passing attack the red spots may correspond, for they too are but of brief duration, and therefore not often seen. At times the papillae would seem to bleed, for small ecchymoses embedded in the substance of the nail may be found side by side with the little pits. The pits may be scattered irregularly; but they often lie in a band transversely across the nail. If the whole matrix be attacked, and for a longer time, this band of pits is replaced by a transverse furrow. The number of the pits varies

considerably; there may be only one or two of them, or the whole nail may be covered. If, instead of being smooth, they are eroded, as is often the case, the nail then looks like the outside of a thimble. The erosions appear as if they had been bored out from the surface with a drill, and, when filled with dirt, look like so many black dots on the nail. When a

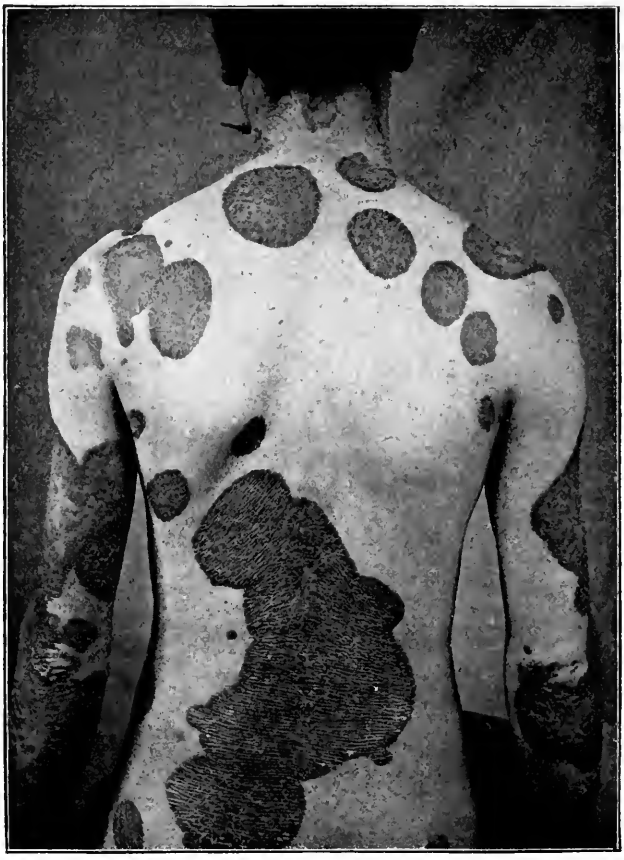

Fig. 78.—Psoriasis. (T. Colcott Fox.)

furrow is thus eroded a deep rough section of the nail substance is exposed, shewing a coarse, longitudinally fibrous base of a dirty grey or fawn colour. Owing, probably, to the action of the foot-gear these changes are not often seen on the toe nails, except on those of the great toes. Any depression or erosion once formed in the lunule remains of course until it grows out at the peripheral edge of the nail plate; which means a period of four to five months for the small nails, and twelve months for the great toe nail (Samuel).

It is easily seen on many nails that the smooth depressions are the forerunners of the deep erosions; and a rapid transition from the one to the other may be well observed during a very acute and general attack. If the primary affection of the matrix spread to the nail bed, the process of destruction of the nail is continuous from the lunule forward; but the nail bed may itself be primarily affected, and the process then usually begins at the edge of the nail. The nail substance grows thicker, more translucent and horny, and is raised up by the growth of a firm mass of scales beneath. These scales become brittle and crumble away, leaving the nail separated from the bed; or the nail substance itself becomes dull and friable, and frays away at the edge. Such disorganised nails are easily thrown off, or, if still held by some part of their base, become twisted and distorted. In one or other of these ways the whole of the nail may be eroded and destroyed, and replaced by a few brittle, irregular, and lumpy crusts which lie like moulds in grooves in the dried-up nail bed. It is extraordinary how conditions such as these may improve, and perfect nails be reproduced, even when the process of destruction has been many times repeated (*vide* also Figs. 161, 162).

Either one or all of the nails may be attacked, and occasionally the lesions are symmetrical on the two hands or feet; this is specially noticed in the general cases which are associated with acute erythrodermia or arthropathic symptoms, when all the nails are commonly involved. Onychogryphosis (*vide* art. "Diseases of Nails," p. 737) is often associated with the chronic cases of this kind, but it must be regarded as a trophoneurosis rather than as a manifestation of psoriasis.

There is a general consensus of opinion that no one of these changes in the nail tissue is characteristic of psoriasis. The pitting is frequently seen in cases of chronic eczema, and may be met with also in syphilis (H. von Hebra) and pityriasis rubra pilaris (Unna); and the other lesions, furrows, erosions, discolorations, and subungual hyperkeratoses are found to be identically reproduced, not only by these same diseases but also by lichen planus and the fungi of ringworm and favus, so that in the absence of characteristic lesions in other parts of the body it is impossible even for an experienced eye to discriminate the one from the other. But psoriasis may occur primarily on the nails (Hardy, Schiff, Bruck, and Méneau) some time before its appearance elsewhere; and, although the lesions are not pathognomonic, the pitting of the surface is so much more frequent in psoriasis than in any of the other affections (Max Radt), that their presence should suggest a careful search for other symptoms of the disease elsewhere.

*General Symptoms.*—In the great majority of cases no general symptoms accompany an ordinary outbreak of psoriasis. Indeed, the general condition of the patients is usually so good that it seems to bear out Hebra's saying that psoriasis is a disease of the healthy. This, however, like most epigrammatic generalisations, is but partially true. Still, the constitutional symptoms which can be connected definitely with psoriasis are remarkably few: there is no fever, or in very acute

and general eruptions in very sensitive patients sometimes some slight febrile disturbance may occur; and there are some associated rheumatoid affections to which reference is made on p. 351. But commonly no alteration in the general health, directly due to the attack, is to be detected, although a previous lowering of vitality (exhaustion, nervous shock) may usher it in. Itching is often present, especially when the disease is extending, and it may last until the extension stops; but individual patients vary greatly in this respect, some are quite free from irritation, in others it is maddening. The worst instances are found in the overfed, especially in large meat-eaters, and topers. In gouty people the eruptions are prone to become inflamed and irritable, hence gout has been regarded as a factor in the causation of the disease.

Pain occurs only when there is cracking or excoriation of the skin; and sometimes during acute outbreaks in the joints when arthropathies supervene. The internal organs are not affected, except reflexly, as in asthma.

*Variations.*—The form, intensity, and distribution of the eruption may vary remarkably, not only in different patients but even in the same patient at different times. A single small patch may be noticed on almost any part of the body, and in a few days, or weeks it may be, the skin may be widely covered with guttate or nummular lesions. Or the original patch may remain almost of the same size for months, and then be tardily followed by other scattered lesions. In many cases these remain as the only manifestations, even when neglected, as they generally are; and occasionally, but rarely, they disappear, either spontaneously or under treatment, and the patient remains free from further outbreaks. More frequently the disease, after a longer or shorter period of quiescence, begins again to extend with more or less rapidity. In some patients these relapses have a certain seasonal periodicity, most of them taking place in the spring or autumn, some during the summer, and a smaller number in the winter; but too much stress has been laid on this supposed periodicity, for the great majority of cases relapse quite independently of seasonal changes. There are some persons, and by no means those in whom the disease is most severely manifested, in whom a fresh outbreak is always coming on while the last is disappearing, so that the skin is never free. Usually there is nothing to account for these fresh extensions, either in the health of the patients or in their manner of life; and so far we have no indication of their immediate cause. Unlike angioneurotic erythema, the form of eruption varies not only in different patients, but even in the same patient at different times and on different parts of the body; this may presumably be due to latent variations in the physiological condition of the skin, and in the phases of its nutrition.

The amount of hyperaemia varies greatly; it is generally more marked in rapidly extending eruptions, and much slighter in more chronic lesions; but the reverse may often be seen. In some the lesions are always livid and angry, in others always pale. The lividity is often most marked in the lower extremities.

The scales also vary greatly in quantity and character. The

silvery scales generally disappear as the eruption passes beyond the guttate or nummular stage, and they become yellower and more sparse, except perhaps on the elbows and knees. The change is probably due to the impregnation of the lamellae with the sweat and sebum which accumulate beneath; for in less fatty skins, when the scales form dry layers between which the air can penetrate, the nacreous aspect is preserved, and the affected area may look brilliantly white. Where the hyperaemia is more intense the scales are less persistent than on those patches which are paler and more chronic.

At times the patches, especially behind the ears and on the hands, may be irritated and take on a quasi-eczematous action; the surface then becomes cracked or excoriated, and exudes; the whole skin is inclined to be thickened and infiltrated, and the scanty scales are mixed with serous scabs. Cracks are not infrequent in old patches on account of their excessive dryness and want of elasticity. And the aspect of the lesions may be much altered by the tearing off of the scales in the efforts to relieve itching, and by the consequent inoculation of pus cocci with formation of scratch pustules.

*Psoriasis and Seborrhoea.*—Some of the lesions found in the still vaguely defined and very multiform affection seborrhoea so closely resemble those of psoriasis as to be at times exceedingly difficult of discrimination. Unna regards seborrhoea, or, as he names it, eczema seborrhoeicum, as very closely allied to, if not actually merging into, psoriasis; and there are psoriatiform, gyrate, and papular forms of seborrhoea which undoubtedly resemble psoriasis very closely; so much so indeed at times as to render a differential diagnosis impossible. When psoriasis is confined to the regions chiefly affected by seborrhoea—namely, the head, ears, face, chest, upper back, and flexures—the doubt may be always there, for in both affections we have the same red scaly lines and patches. When the firm white scales are present the doubt is removed; these are found in psoriasis, but not in seborrhoea. Yet on the face, which scales but slightly, and in the axillary, anal, and scrotal regions, where the scales are often macerated away and a raw surface left exposed, the two diseases may to the eye be inseparable. The difficulty is increased by their not infrequent symbiosis; and the psoriasis may remain masked until the removal, by treatment, of the seborrhoea and greasiness of the skin reveals its characteristic patches and scales. It has been supposed that psoriasis may originate in such seborrhoeic dermatoses, either directly through transition, or indirectly, as do tertiary syphilides, by finding there a place of least resistance. The reverse, however, is certainly true, that psoriatic lesions become contaminated with seborrhoea; and, if the seborrhoea become eczematous, the psoriatic patches may take on an exuding eczematous aspect. (This is not the psoriasis eczémateux of Devergie; he designated by this name the acutely inflamed, irritable, diffuse condition, with ragged scales and easily exuding, which is found in psoriasis patches which are passing into a state of exfoliative dermatitis.) More commonly the effect of the seborrhoeic condition of skin is to render the scales in certain

regions yellow and greasy. The patches in such parts may then assume a salmon tinge like that of the psoriatiform seborrhoea, and it may appear as if that affection were present on the head and trunk, and a psoriasis vulgaris on the limbs. On the scalp the ordinary discrete patches of psoriasis are often lost in the diffuse scaling of the seborrhoea.

But the most striking combination of the two affections, though not very unusual, I have never seen specially described. A psoriasis patient with a seborrhoeic skin (oily, yellow-brown pigmentations and desquamations, seborrhoea capitis, and perhaps some "lichen circinatus") may manifest lesions over the sternum, or between the shoulders, which will spread, often with great rapidity, to form large patches with sharply defined geographical edges. In some cases this condition has spread over the trunk and extended to the limbs. The colour is a dark or even livid red, and it is covered, not by scales, but by a glazed minutely nodular layer, as if a solution of gum tragacanth had dried unevenly over the surface. There may be no real desquamation, and it never weeps. It is very obstinate, it is little influenced by tars, but it will yield gradually to pyrogallol and chrysarobin. On the limbs similar patches may occur discretely, but the eruptions there are usually those of simple psoriasis.

*Psoriasis and Exfoliative Dermatitis.*—At times the course of a psoriasis undergoes a sudden change. The patient has a feeling of malaise and chilliness, with rheumatoid pains and pruritus, and sometimes feverishness; a scarlatiniform dermatitis then sets in, and raised erythematous-looking blotches and even urticaria-like rashes may appear. These spread, and more or less quickly (in a few days or weeks) cover the whole body, from scalp to toes. The previously existing patches of psoriasis are lost in the general invasion. The colour turns from a bright to a livid or deep red, the thick skin of the hands and feet is thrown off in large flakes, and that of the limbs becomes either rough and furfuraceous or is covered with large papery lamellae. Beneath these lamellae the skin is moist; but after they have fallen it is left in a thin, soft, shining, tender condition, and of a deep dark-red colour. The face is drawn and tight, and there may be some ectropion. If this state continue, as it may do for months, the nails and hair are liable to fall, and various disorders of the internal organs supervene.

These symptoms may arise spontaneously, as it seems, in untreated cases, and even during the first outbreak of the disease; or they may follow an irritation set up by strong medicaments, such as tar or chrysarobin, or even under too extensive india-rubber dressings (Besnier). This excessive irritability generally comes on suddenly; but in some cases it may be constantly present. It is certainly more common in those who are affected with chronic rheumatic joint affections and rheumatoid arthritis, and in drunkards; but in the majority of cases there is no apparent cause. It occurs more often in connexion with psoriasis than any other skin disease, but as it also occurs in persons suffering from eczema, lichen planus, erythema papulatum, and other affections, it must

be looked upon rather as an accident than as an essential part of the disease. It is usually regarded as a milder form of pityriasis rubra, though Devergie and Besnier distinguish between this form of psoriasis rubra acuta and the slow, malignant, cachectic type—the *herpétide exfoliatrice* of Bazin—and the pityriasis rubra of Hebra. Certainly the prognosis is different, for whereas the former is amenable to treatment, often readily so, and may recur more than once and disappear, the other is always fatal. But clinically it would be difficult to draw a sharp line between well-marked cases of the two conditions before the fatal marasmus has set in.

In rare instances the extension of the pityriasis is only partial; Bulkley has recorded such a case in which it was confined to the limbs; and I have seen an instance in an old man in whom the change slowly affected the psoriatic lesions on the limbs and head only, leaving the body free.

**Prognosis.**—Patients suffering from psoriasis vary so greatly in their susceptibility or capability of resistance to the disease, that it is beyond our power to give a prognosis in any individual case. That, however, which general experience suggests is not of a very cheerful kind: some may be cleared of it by a more or less laborious treatment, and others, but only a very small percentage, heal spontaneously. In the great majority it recurs sooner or later. Some pass rapidly from one attack to another, others have an annual outbreak, and others again may remain apparently free for years and then suffer from a fresh outbreak. If the proximate causes can be discovered and rectified, or avoided, the outlook is improved, but in the bulk of the cases this cannot be done; and, unless favourable changes set in spontaneously, the prognosis must chiefly depend on the results of treatment. As we possess no internal specific, this treatment consists mainly in the application of local remedies; and to be of avail it must be pursued until the skin is absolutely clear, and continued, in some modified form at any rate, for a long time. It is rare to find patients who are sufficiently intelligent and persevering to carry out a troublesome and disagreeable course of treatment after all the symptoms seem to have disappeared, especially when their hopes are dashed by the repeated outbreak of fresh patches. If the underlying cause of these relapses, be it spinal irritability or any other form of internal or reflex irritation, can be detected and controlled, the outlook may improve; but at present the prognosis cannot be good beyond the existing attack.

**Differential Diagnosis.**—The great majority of cases of psoriasis are easily recognised, even by those who have the least acquaintance with skin diseases; but when the lesions are scanty, or slightly marked, or restricted to small and unusual areas, mistakes may readily arise. It is always advisable to look at the disease from all points of view: its course, duration, symptoms, liability to relapse, and its connexion with the general health of the patient; but the examination of the lesions on the skin has to be the final arbitrament. And, as it is chiefly in the older lesions that the danger of confusion lies, it is well (as in all cases of skin disease) to seek out the earliest initial lesion, when such can be

found, since in these the distinctive characters are much more clearly marked. The minute, scattered, often solitary, red points with the profuse white scaly caps are readily recognisable; but as these pass into various shapes, become inflamed, scratched, or modified by treatment or by the supervention of other affections such as impetigo or seborrhoea, the task of recognition may be difficult.

The following diseases may all appear in the form of red scaly patches, and bear at times a sufficiently close resemblance to psoriasis to demand a careful discrimination.

*Seborrhoea.*—When acutely eczematous the distinction is easy; but the scaly papular forms are at times very like the corresponding lesions of psoriasis. Yet the patches are more superficial and irregular, and the scales smaller, thinner, softer, less profuse, and often more greasy; the colour of the base has more of a salmon hue when fresh, and a dirty yellow or fawn colour when older. When gyrate the lines are thinner and more polycyclic. Other evidences of seborrhoeic infection are usually to be found on the chest and upper part of the back, especially over the sternum and between the shoulders, as slight papules at the mouths of the sebaceous glands, which are blocked with greasy scales in the form of a minute plug. These papules have a great tendency to communicate with neighbours to form small polygonal figures, the centres of which are of a dirty dull-yellowish tinge. Further evidences are almost always to be found about the middle third of the face, on the forehead, and on the scalp. Psoriatic eruptions on the scalp are in patches with intervening healthy skin, whereas seborrhoea tends to be more diffuse and to involve the whole scalp without forming distinct patches. One uncommon form of sharply circumscribed eruption, which builds up a thick scab like psoriasis, has been referred to before as presumably seborrhoeic; its scales, unlike those of psoriasis, surround the hairs like collars. Seborrhoeic dermatitis of the palms and soles again is more diffuse than that of psoriasis, and retains its scales better; the thickened skin over the psoriatic lesions peels off more readily, leaving a red dry base.

*Eczema.*—The patches are not by any means so clearly defined as in psoriasis, the scaling is much less in quantity, and the scales are smaller, softer, and never silvery white when removed. Both may itch, be scratched, denuded of scales, inoculated with pus cocci, and cracked with fissures; but there are usually some characteristic signs of punctate oozing on an eczematous patch, or some papular or vesicular satellites in its immediate neighbourhood (*vide* also p. 320).

*Pityriasis rosea.*—The resemblance of this affection to a slight eruption of psoriasis is sufficiently close at times to confuse those who are not well acquainted with it. The patches and gyri are, however, much slighter and paler than those of psoriasis, and not so clearly defined; the scaling is much less marked and more branny, and the course of the disease is much more brief and rapid. The bleeding points are also absent.

*Lichen planus.*—Patches of this disease which have become scaly may bear a certain resemblance to those of psoriasis; but if the scales be

scratched away it will be found that the base, instead of being red and tender, is firm and more horny, and that the under scales are granular, like mortar, and more adherent. A lilac shade of colour, too, may usually be detected, and some deep brown pigmentation where the eruption is fading. The smaller papules, when present, are easily distinguished from those of psoriasis by their smooth, flat, waxy tops. The later corneous stage has a grey, raised, irregular, horny surface, which is pitted like a fine honeycomb; and the pruritus is more intense and persistent.

*Lupus erythematosus.*—The patches are covered with very adherent scales, and the mouths of the sebaceous glands are dilated and filled with horny plugs. The red erythematous border and the evidences of superficial atrophy offer further points of distinction.

*Lupus vulgaris.*—Old patches of non-ulcerative lupus may sometimes closely resemble patches of psoriasis from which the scales have been removed; but in case of doubt they may be easily identified by pressing upon them with a piece of glass until they become bloodless, when the characteristic yellow nodules may be seen embedded in the corium.

*Syphilis.*—It is well recognised that some of the squamous syphilides may at times so closely resemble the lesions of psoriasis as to be clinically indistinguishable from them, even to a well-trained eye. Both are red; both punctate, papular, circinate, or gyrate; and both are covered with white scales. The syphilides are, however, as a rule more uniform in size, and much less scaly; they have a more translucent-looking base, of a red colour which tends to a yellowish-brown, and are much more prone to take on a figured arrangement, the small papules being arranged in corymbose groups, the larger papules in circles, arcs, or gyri. When the eruption is extensive, or when it occurs on the flexures, there will be little danger of confusion. It is with the isolated groups that the difficulty arises. The method of scratching the surface (not with the finger nail) may be resorted to as a help; for the punctate bleeding is never present in syphilis. In the later squamous syphilides the base is generally much more elevated than in psoriasis, especially at the borders; but in the gyrate form the resemblance is often exceedingly close. The position is as likely to deceive as to help; but the presence of ulceration or scars, deep pigmentation, or constitutional symptoms may clear up the mystery at once; or an appeal may be made to treatment. For obvious reasons this means of diagnosis should be the last resource (*vide* also p. 510).

**Treatment.**—The treatment of each practitioner, if other than empirical, will depend to some extent on the view which he takes of the causes of the disease. But all are agreed as to the supreme value of the local treatment. Brocq says: "For the older authors the internal treatment of psoriasis was everything, for the modern authors it is, so to speak, nothing." Even those who look upon psoriasis as a neurosis lay stress on local remedies for the purpose at least of clearing the skin; but those who hold to the view of its microbic origin lay equal stress on their continuance, as an after-treatment, in the hope of finally extirpating the germs.

*General Treatment.*—The health of those who suffer from psoriasis, I repeat, is usually good; still the first task in beginning their treatment is to correct any deficiencies in this respect, if such can be detected; for lowered states of vitality may not only precede and aid the spread of the eruption, but may render it also more resistant to local treatment. Gouty conditions, for instance, may make the lesions irritable and inflamed; and it is advisable at once to take measures to counteract them, not only by administering drugs, but also by ordering copious draughts of water (at suitable spas if possible), and by limiting the supplies of meat and alcohol. Bulkley (7) says that a number of his patients have been kept free from the eruption for long periods of time simply by taking no meat, or no more than a very little fish and the white meat of poultry. Neisser finds that butchers are specially liable to suffer from the disease. If the eruption is irritable, alcohol ought to be prohibited altogether; if, on the other hand, the patient is in low condition, an improvement in the diet may be of service. Exposure to cold and chills may induce fresh outbreaks, and I have patients who were especially liable to attacks when living in wet and cold localities, but improved in a warmer climate. Sailors and travellers sometimes lose their eruptions in the tropics. In these cases the body should be protected by suitable underclothing either of cotton or silk and wool.

In the case of a distinctly neurotic element it is advisable to have recourse to bromides, valerianates, or hydropathy, as an accessory treatment; since nervous excitability has at times a deleterious influence on psoriatic eruptions. Rest is of great value in extensive or acute cases, and confinement to bed alone will often reduce the vigour of an attack considerably. If the patients are ordinarily strong healthy people none of these preliminaries is required, and we may proceed to administer drugs to act directly on the disease itself.

*Internal Remedies.*—The only medicine which is universally acknowledged to have anything like a specific action on psoriasis is *arsenic:* but it is by no means a specific, for it does not act under all conditions; in some patients it does not act at all, and if the eruption be acute, and tend to spread, it will probably do more harm than good. Its method of action is uncertain. Schülz tried to explain it by supposing that it increased the movement of the oxygen in the affected cells by taking it up from one substance and giving it to another as it passes from arsenious to arsenic acid and back again, a property for which it is extensively made use of in dyeing. It has also been supposed to act directly as an oxidising agent on the blood; but Zelenew and Quinquaud found that the amount of haemoglobin is diminished in psoriasis, and that this diminution is not prevented by the administration of arsenic. Zelenew thought that the improvement which it produces in the disease must therefore be due to its action on the nervous system; but, as Unna succeeded in removing an eruption of psoriasis completely by means of a mild ointment of arsenate of potassium (which has no caustic action), it would appear as if the action were rather local than general; a view which is supported by the

after-pigmentation of the patches. Kuznitzky attributes its beneficial influence to its power of dilating blood-vessels, and thus relieving the hyperaemia of the lesions, or of the irritated spinal ganglia; as a mustard foot-bath relieves internal inflammations by "derivation." Arsenic may be given either as the potash or acid solution of the Pharmacopoeia, or as a soda solution of like strength. The dose of the liq. arsenicalis, which is the preparation most commonly employed, should be at first (for adults) 3 minims, gradually increased up to 10 minims, given in water, after meals, three times daily; if well tolerated it may be increased still further; but it should be stopped if smarting of the eyes, gastric pain, vomiting, or diarrhoea supervene, which in some patients they do very quickly. Crocker found that the addition of 30 minims of tinct. lupuli to each dose favours toleration. It may also be given in pill form, each containing $\frac{1}{20}$th to $\frac{1}{12}$th of a grain of arsenious acid; one to three pills being given daily, and gradually increased within the limits of toleration. In Vienna the favourite method of prescribing the drug was in the form of the "Asiatic pill" which contained $\frac{1}{12}$ of a grain of arsenious acid and one grain of black pepper. Kaposi prescribed one to four of these pills three times a day, and continued them till the patient had taken several hundreds, only intermitting them when toxic symptoms arose. The solution freely diluted is less apt to cause trouble than in pill form. Administered in this way it may certainly effect the complete removal of all the lesions from the skin in some cases, and in most it will render some help. It has no influence in preventing relapses; and at the best it works very slowly, requiring some months to complete its task; often, indeed, five or six weeks elapse before its influence is visible. Subcutaneous injections (Lipp) act more quickly and have given good results. Three drops of Fowler's solution may be given each day in 10 minims of distilled water, and the dose gradually increased. To render the solution aseptic the injection may be boiled first, or $\frac{1}{6}$ of a grain of carbolic acid added to it. There are several disadvantages connected with the use of solutions of liq. arsenicalis for injection, such as the difficulty of satisfactory sterilisation, its irritant action, and its liability to decompose. As a substitute for it, Gottheil has recommended a 1 per cent solution of sodium arsenate in distilled water (liq. sodii arsenatis) as being less liable to undergo deleterious changes. This solution can be reboiled and filtered when necessary. The minimum dose is 3 drops ($\frac{3}{100}$ grain) a day, and this is increased by 1 to 3 drops daily till the limit of toleration is reached.

Vidal, from his experience of a large number of cases of psoriasis, found that arsenic, given in small doses, is useless; yet in doses large enough to be efficacious there is the danger of inducing intoxication, with gastro-intestinal irritation and peripheral neuritis. And, even though the danger of causing serious symptoms be not great, many patients will object to the drug on account of the minor discomforts. Furthermore, the possibility of a hyperkeratosis of the palms and soles, due to its action (Hutchinson), is by no means very distant (*vide* p. 104). The skin

thickens and grows rough, sometimes with the accompaniment of a burning sensation; and small warty elevations rise above the surface, which seem to be peculiar to the action of arsenic. In some patients this condition is soon induced, in others it is more insidious; but, once acquired, it is very difficult to remove, and soon begins to increase if any more arsenical preparations are administered.

Danlos has recommended the employment of cacodylic acid in place of the arsenate salts: this is a combination of arsenic with methyl radicals, it contains 54 per cent of arsenic, and is best given as a mixture in which the acid is neutralised with soda, and flavoured with rum, syrup, and peppermint. The dose is 1·5 grain repeated three to six times daily. The sodium salt, known as cacodylate of sodium has also been employed in doses per diem of 1·5 grain by the mouth or of $\frac{1}{5}$ to 1 grain injected hypodermically. The dose of 1·5 grain contains as much arsenic as 103 ♏ of liq. arsenicalis. Danlos and others have found it to possess remarkable curative powers in cases which had resisted all other treatment; and, although Balzer and Griffon record two cases of exfoliative dermatitis which followed its use, it is said to be remarkably free from the other poisonous properties of arsenic. The greatest drawbacks to its employment seem to be the odour of garlic which it imparts to the breath, and the digestive disturbances and diarrhoea with fetid stools associated with its use.

According to Sir T. Fraser the therapeutic value of this drug has been overrated, and he points out that the reason why such large doses of arsenic can be taken in this form without untoward results is because, when taken into the body, the arsenic does not become dissociated and passes through without exerting its toxic or therapeutic action to the full extent.

Recently the organic preparations of arsenic known as the arylarsonates, namely, atoxyl, soamin, arsacetin, and orsudan, have been employed in the treatment of psoriasis. These should be given in the form of intra-muscular or subcutaneous injections, as when taken by the mouth they are broken up by the acid contents of the stomach, and toxic effects are more liable to be produced. Of these arsacetin has the advantage of being less toxic than atoxyl, and does not decompose on boiling. It is a sodium acetyl-arsanilate, and is employed in a 10 per cent solution, of which 60 minims (6 grains) may be injected every second day. With regard to the dosage, however, cognisance should be taken of the body weight and the powers of elimination of the patient, and if the weight be below the average or the kidneys diseased the dosage should be reduced accordingly. So far the results from the use of these preparations on psoriasis have not been sufficiently encouraging to warrant their employment in view of the serious toxic symptoms to which they may give rise.

Iodide of potassium also, like arsenic, may claim a quasi-specific power against psoriasis, but, unless given in the large doses recommended by Haslund, from 10 grams up to 50 grams daily, it usually fails to exercise

any influence whatever. The large doses seem to be well tolerated in most instances, perhaps owing to their diuretic action and the consequently quicker elimination; but they are apt to cause acceleration of pulse and some feverishness (iodine fever). The action on the disease can hardly be a local one; for Gerhardt found iodine in the ashes of the scales from a patient in which the iodide had failed to influence the eruption to any great extent after being given for some weeks. Many complete successes in the removal of the eruption are now recorded, though the proportion to the failures is not large. Seifert had only four recoveries out of thirteen cases, even after seven weeks of treatment, during which the patients had taken from 334 to 850 grams of the salt. Large doses may cure arthropathies, even though they fail to relieve the accompanying eruption on the skin (Besnier). In much smaller doses I have found it to improve rebellious outbreaks of deep colour in full-bodied men in whom local treatment was not well borne; but I have never ventured to use it in Haslund's heroic doses.

Turpentine was recommended by Crocker in doses from 10 ♏ up to 20 ♏ three times daily, administered in capsules or in a gummy solution. Although tincture and syrup of lemons help to mask the taste, I have found patients very intolerant of it. Plenty of barley-water should be given, and a sharp look-out kept on the action of the kidneys.

Salicin and the salicylates have also been strongly recommended by Crocker as substitutes for arsenic; of the two salicin is less liable to depress the patient. It is given in doses of 10 up to 20 grains three times a day. To counteract the depressing symptoms and headache which it may produce, it should be combined with tincture of nux vomica. It is believed to act as a microbicide.

Carbolic acid has been employed with much benefit by Kaposi, who gives three to six pills daily, each containing one grain. He considers it to be quite as efficacious as arsenic.

Balsam of copaiba was found accidentally, by Hardy, to have cleared away an eruption of psoriasis, and it has been employed for that purpose, with good results, by McCall Anderson and others. The dose must be gradually raised until the eruption disappears, or until a copaiba rash is produced, when the psoriasis often rapidly vanishes.

Tartarated antimony has been praised by Sir Malcolm Morris in the acute stages of the disease, and I have used it extensively with great advantage. The wine is the best means of administration, and 15 ♏ three times daily is not too large a dose. It is often well to combine it with the acetate or citrate of potassium on account of their diuretic action.

Thyroid gland, which was introduced as a remedy for psoriasis by Dr. Byrom Bramwell, has failed to establish for itself the position which he anticipated. It has cleared away the eruption, even in obstinate cases; but it works slowly, and it does not prevent relapses. Dr. Abraham, who tried it extensively, had not very encouraging results; my own have been entirely negative, but they were all made on out-patients. It may give

some help, as it undoubtedly does in certain other skin diseases; but we do not know its special indications, and for general purposes it cannot compare with other internal and external remedies. Sir Clifford Allbutt, on the other hand, suggested thyroid extract in a severe and inveterate case of psoriasis in a male adult with little hope of success, as previous prolonged and skilful treatment had failed. To his surprise the patient some months afterwards reminded him gratefully of the advice, for the extract had cured him rapidly and completely. There must be some difference of genesis in cases which behave thus differently under treatment.

Mercury has been strongly recommended, by Mapother and others, in the form of pills. Brault has effected the complete removal of eruptions of psoriasis, in non-syphilitic patients, by injections of 5 cg. of yellow oxide of mercury. The cure was said to be completed in each case in three months after six or seven injections had been made.

Crocker has occasionally obtained good results in resistant cases from the injection of $\frac{1}{4}$ grain of sozoiodolate of mercury twice a week.

Mineral waters seem to have no direct influence on psoriasis, except such as contain arsenic (La Bourboule, Roncegno, Levico); these may be of service in removing the irritation of gouty and rheumatic conditions. Sea-bathing, however, although denounced by McCall Anderson, is often beneficial. I have found it useful in some cases, and Nielsen and Sir M. Morris have seen rapid disappearance of the eruption in obstinate cases in patients who bathed freely in the sea. In these bath cures it is uncertain whether the tonic action of the bathing and the recuperating effect of the change and relaxation assist the patient rather than the direct action of the waters on the disease. In the case of indifferent thermal or weakly alkaline waters it must be this, in conjunction with the maceration of the scales, which does the good.

*Local Treatment.*—There is nothing more specific among the external remedies for psoriasis than among the internal; and it would be useless to try to enumerate all the consequently numerous drugs, and recipes for their application, which have been tried and recommended by different writers. It is better to indicate a method of selection in the remedies we employ rather than to catalogue a bewildering mass of formulas; for more of the failures to attain results are due to the inefficient and indiscriminate use of remedies than to the inefficiency of the remedies themselves.

The treatment in ordinary cases may be divided into three stages:—(i) the removal of scales and the lessening of hyperaemia; (ii) the application of stronger remedies to effect the removal of the lesions; (iii) after-treatment.

(i) The method to be adopted to get rid of the scales must depend on the state of the disease at the time. This principle, indeed, applies to the treatment of the disease in every stage, and cannot be too strongly insisted upon, for when an eruption is acute and spreading only harm is likely to ensue from any but the mildest measures; whereas in chronic

and indolent patches vigorous "stimulation" may be not only tolerated but necessary.

Thus in acute cases any rough mode of clearing away the scales must be avoided. Soaking for half an hour in a warm bath (95° to 100° F.), to which water boiled with bran or starch (½ lb.) and soda and borax (each ¼ lb.) have been added, is very soothing and emollient; and a few ounces of liq. picis carbonis may be added to relieve itching. For more restricted eruptions water compresses can be employed; or, better, compresses of very weak creolin lotion. India-rubber or mackintosh coverings are certainly effectual, but are sometimes apt to cause irritation. Vapour baths help not only to remove the scales, but also to clear away the underlying patches. Baths of natural sulphur-water, such as those of Harrogate and Strathpeffer, and those made artificially by the addition of calcium sulphide, probably owe their value to the desquamating action of the sulphur on the skin.

One of the most effective agents for getting rid of the scales is salicylic acid: it may be used as a 5 to 10 per cent ointment, and either rubbed in after the bath or applied alone; or it may be used locally as a plaster, by preference the salicylic soap plaster (Pick), which Neisser rightly says is less caustic than the ordinary kind (Unna). But if the eruption is very acute and inflamed, a simple zinc plaster will be as much as the skin will tolerate, and it macerates and loosens the scales very effectually; or it may be better at first to keep the parts soaked with a lead and calamine lotion until the angry stage has subsided. In all but very chronic cases I use an ointment composed of kaolin 1, starch 1, soft paraff. 2, to which about 2 per cent each of glycerol. plumbi subacet., liq. picis carb., and acid. salicyl. are added at first, and the quantities gradually increased; this base has the advantage that it does not dry and rub off as do the thinner ointments. The glycérine d'amidon is a favourite medium among French physicians in applications for psoriasis, probably for the same reason.

For removing the scales from the scalp, and as a first treatment for the disease, a weak sulphur ointment with some liq. picis carbonis is very effectual; or the skin may be soaked with a solution of the liquor in water, beginning with a proportion of 1 : 8, and macerated under a waterproof dressing. The salicylic ointment is also effectual. Shampooing with soft soap, spirit, and water is the best means of cleansing the scalp when the scales are softened.

The action of ointments is much intensified if, after they have been freely rubbed in, the skin is covered closely with flannel or flannelette; on the limbs these coverings are made most conveniently in the form of bandages, and on the trunk with large pieces fitting like a "chest-preserver." For the scalp an oil-skin bathing-cap may be used, or a tightly-fitting india-rubber bathing-cap.

(ii) When the scales have been removed and the acuteness of the eruption has subsided, and not until then, stronger remedies may be applied. In fixing the strength of the applications it is most important

to bear in mind the very varying degrees of toleration of different skins, and to begin tentatively with weak doses of each fresh preparation until the amount of reaction of the individual skin has been ascertained.

The remedies which have been found most generally useful are tar, chrysarobin, and pyrogallol.

The varieties of wood tar which are most in favour are juniper tar (oleum cadinum), beech tar (oleum fagi), and birch tar (oleum rusci). Leistikow, after a long series of experiments, found that their therapeutic effect is practically equal, but that oleum cadinum is the least irritating. Brocq says that this oil is sure in action, easily tolerated even in hairy regions, and, in spite of its colour and smell, is still the best medicament for psoriasis. In my experience, however, none of the wood tars can compare in utility to coal tar, which is quicker and more penetrating in its action, and relieves irritation and itching better. An alcoholic extract (liq. carbonis detergens), and the one made with the addition of quillaia, now official as liq. picis carbonis, have practically ousted all other forms of tar in this country for many years past. Leistikow recommends an alcoholic and ethereal extract (coal tar 3, alcohol (95 per cent) 2, ether 1), which he calls tinct. lithanthracis; this I have found distinctly more active than the simple alcoholic extract. With the addition of a little glycerin or castor oil it makes a good varnish, to which salicylic acid can be added with advantage. Beiersdorf makes a useful plaster containing the two substances, but the tincture painted on and covered with zinc plaster answers almost better.

In extensive eruptions it is better to apply the tar freely over the whole skin. The patient should be well rubbed either with oil of cade or prepared coal tar mixed with soft soap, and then soaked thoroughly in a warm bath. On coming out he should be dried and again well rubbed with a tar ointment.

On the Continent oil of cade is often applied in the undiluted form; but it is safer, in dealing with patients in this country, to dilute it considerably, at any rate at first; for I have found that few will stand the pure tar. An ointment containing ℥ss.-℥ij. to the ounce is usually quite strong enough; and, in order to increase its keratolytic action, caustic potash in the form of soft soap or salicylic acid may be added, the latter being the more active agent. For this purpose Hebra's well-known modification of Wilkinson's ointment (℞. Sulph. praec., ol. fagi, āā 5, saponis mollis, adipis, āā 10, cretae pulv. 1) may be used. In Vienna it is rubbed in twice a day, for a week or ten days; and a bath given as soon as the epidermis is falling. For more restricted application the ung. picis B.P. with acid. salicyl. (gr. 15 to the ounce) is very serviceable. After the inunction the flannel coverings should be carefully adjusted. The urine ought always to be kept under observation, so that the moment any discoloration is detected the ointment may be stopped. Furthermore, if the skin shew any signs of irritation, or of tar acne, it must be cleansed at once from the tar, with oil and soap, and dressed with a sedative ointment or lotion until it is safe to begin again with a weaker preparation.

It is not advisable to use tar ointments of such strength and consistency to the scalp and face; here milder and less offensive measures should be used. For this purpose ung. hydrarg. ammon. with the addition of liq. picis carb. ʒss.-ʒj., and acid. salicyl. gr. 15 to 1 oz., is very useful; and naphthol and resorcin ointment (20 to 30 gr. of each or both to the ounce of ointment) is cleanly, inodorous, and effectual. For the scalp, where the desquamation is apt to be troublesome, a soft ointment containing sulphur praec. 20 gr., acid. salicyl. 20 gr., and liq. picis carb. 20 to 60 ♏ answers well.

By these means alone a very large number of cases of psoriasis can be thoroughly and often quickly cleared; but none of them can at all compare in brilliancy of action to chrysarobin. The ease and safety with which in some cases this drug causes the lesions to disappear from the skin unfortunately leads to its routine employment in cases of every degree; whereas it ought never to be used while the disease is at all acute, and at first always somewhat tentatively. The patient should be warned beforehand about its staining properties, and the danger of setting up conjunctivitis if it should touch the eyes; the staining of the clothing is indelible, and too many patients are allowed to gain their experience of it exhaustively by the loss of much fine linen and the gain of much unwished-for purple raiment. That the patient must be confined to his room does not matter, for no one can be properly treated for extensive psoriasis while going about and wearing ordinary clothing; he must give himself up absolutely for three or four weeks to the exigencies of the treatment, or be content to drift on for months uncured.

If the patches are small the staining can be limited by applying the chrysarobin in the form of plasters, or in solution in liq. guttaperchae or collodion; or by painting it on as a chloroform solution and covering it with plaster or gutta-percha: but, unfortunately, no other vehicle brings out its exceptional properties in anything like so marked a degree as an ointment. A tar plaster is better than one of chrysarobin, and both tar and pyrogallol work better as paints and varnishes than the chrysarobin. As patients differ greatly in their tolerance of this drug, it is always well to begin with a small dose—10 gr. or even less to the ounce. The addition of salicylic acid increases its penetrative power, and ichthyol diminishes the likelihood of the rapid, angry-looking dermatitis which an overdose so quickly sets up. Thus Unna's ung. chrysarobini co. contains: chrysarobini, ichthyolis āā 5·0, acid. salicyl. 3·0, paraff. mollis 100·0. Hutchinson's ointment—℞ Chrysarobini, hydrarg. amm. chlor. āā gr. x., liq. picis carb. ♏x., paraff. mollis ʒj. — is very efficacious; creosote (10 ♏) is added in some formulas, and although it increases the general effect it is hardly admissible except in a hospital. Great care must be exercised in the use of any ointment containing mercurials when spread over large surfaces of the body, especially when the patients are kept in bed or even covered with bandages; for in such circumstances quantities so small as 5 gr. of the white precipitate

to the ounce of ointment may in sensitive subjects rapidly bring on stomatitis and gastric symptoms.

If the chrysarobin is well borne the amount should be increased gradually, but the action of the stronger ointments should always be limited carefully to the affected areas. Very soon the lesions begin to fade away until they look like white patches among the surrounding dull red staining of the normal skin. The whiteness is not indicative of the obliteration of the disease as is so often supposed, on the contrary, it is the continued presence of the disease which prevents the staining; and not until the complete staining of the previously white patches has taken place can the patch be considered as properly cured. Occasionally, however, but rarely, the achromia is permanent, and then it must be regarded as a direct result of the action of the chrysarobin. If any dermatitis should be produced, the drug should be removed at once and replaced by a soothing lotion of lead, zinc, and calamine. It is always well to avoid any application of chrysarobin to the scalp and face, not only on account of the very great discoloration of the hair and skin, but because by its action the face is particularly liable to be easily irritated, and to become acutely inflamed and swollen. An ointment of sulphur and resorcin accelerates the removal of the stained skin, and the nails may be cleared by scraping; but nothing but time will get rid of the dirty-greenish discoloration of the hair.

Pyrogallol is certainly next in order of merit to chrysarobin in its power of removing the outbreaks of psoriasis; but, besides having an almost equal power of staining the skin and nails, it may set up a very painful local inflammation with the formation of vesicles or bullae; and, if too large a surface be exposed to its action, it may give rise to haemoglobinaemia and haemoglobinuria from which fatal results have been recorded. It is best confined to the scalp, where its action is exceedingly good; an ointment containing 2 to 5 per cent is usually quite sufficiently strong, and its effect may be still further increased by associating with it some salicylic acid. Ichthyol may be added with advantage, either to an ointment such as Unna's ung. pyrogallol. co., in which pyrogallol takes the place of the chrysarobin in the former prescription, or the two may be combined in the form of a lotion which I apply with safety over large surfaces:—℞ Pyrogallol gr. xv., liq. pic. carb. ℥xv., ichthyol ʒj., aq. ad ℥j. A fresh solution of pyrogallol and salicylic acid (āā gr. xxx. in collodion ℥j.) is a cleanly and efficacious remedy for small isolated spots and patches. Unna advises, on rather speculative grounds, that hydrochloric acid should be taken internally as a prophylactic whilst pyrogallol is being used externally; but it is important to keep a good watch for sickness and discoloration of the urine, and then at once to suspend its further application. With due care, the danger of poisoning is very slight.

Antharobin, though milder than chrysarobin, is yet a useful drug, and I have had cases in which it worked well when chrysarobin was not tolerated; but it is not altogether free from inflammatory capabilities,

and the deep, dirty, madder-lake colour with which it stains the patient and his bed-linen and clothes is beyond all apology.

Endeavours are continually made to discover agents as quick and trustworthy as those we have just mentioned without their by no means inconsiderable drawbacks. Crocker tried turpentine with good results, one part dissolved in eight of oil; but the odour is too strong even for perfumes to mask. Pine oil and thymol, though useful mild remedies, have the same defect. The milder mercurials, the oxides and ammonio-chloride, are useful, especially about the face and scalp; and they work well with a little tar tincture and salicylic acid. Gallanol is unobjectionable, and may be used as a 2 to 10 per cent salve, or as an alcoholic varnish to the exposed parts; but it works slowly. Hydroxylamine and hydracetin are irritating, dangerous substances, to be carefully avoided. Gallacetophenone is a yellow powder allied to pyrogallol in chemical formation, and, although cleanly and not poisonous, it is very much less active, and works but slowly in a 10 per cent salve.

For the removal of chronic resistant patches, the *x*-rays have proved to be of the greatest value. A single Sabouraud-pastille dose at a distance of 15 cm. from the anticathode is usually sufficient to remove the most resistant patch, but should it fail to do so, a second dose may be given after an interval of two months. Recurrences are just as liable to take place when the *x*-rays have been used, as after other forms of treatment. On account of the dangers from excessive dosage of the rays this treatment should only be employed by an expert.

(iii) *After-treatment.*—The tendency of psoriatic eruptions to reappear on sites from which they appear to have been completely removed shews that some remnants of the disease may persist which are inappreciable to the eye. Whatever explanation may be offered of this fact by the supporters of different views of the causation of the disease, experience proves that these recurrences are much less prone to take place if the skin is subjected to a long-continued after-treatment. Those who incline to the parasitic view look upon this as a means of inhibiting and destroying the germs, with the hope of finally getting rid of them completely. With this purpose the patients are ordered to take frequent baths with tar soap, and to sponge over the body with solutions of liq. picis in spirit or water, with frequent inunctions of ointments containing salicylic acid and naphthol, or other cleanly and inodorous drugs, and the application of tars or the other stronger remedies to any definite signs of eruption at the moment of their birth. Few patients have any conception of the thoroughness which is essential to a bacteriological disinfection in a structure so full of harbours as the skin; and even those who have persevered for a time are finally lulled into a feeling of false security, and, very naturally, want to "give themselves a holiday," during which the disease regains its hold. But in a few patients who have had the intelligence and the perseverance to continue in spite of the apparent completeness of their recovery the results have been most gratifying;

and instead of being tormented by continual and extensive outbreaks, they have long periods of complete freedom, broken only by the occasional appearance of a papule which can be quickly removed. The process is, in fact, the logical sequence of the previous employment of a series of antiparasitic remedies, and is analogous to that of weeding a garden; we have no means of learning, by any microscopical or other test, when our work is finished; and we have to go on until we find that no more weeds appear. Even then there is always the possibility of a fresh infection; and Neisser suggests that this may be brought about by articles of clothing, as is the case with seborrhoea and tinea versicolor.

Thus, although we are not justified in saying definitely that psoriasis is incurable, for cases have been cured, it is obviously impossible to promise the patient anything more than a longer or shorter period of freedom from his eruption. Practically in every case, however bad, the skin may be cleared if the medical attendant have sufficient skill and experience, and the patient sufficient confidence and determination, and can give the necessary time and attention. But even the serious patient, "qui veut se traiter," as Brocq says, may well be sympathised with if at times he loses heart and neglects his never-ending treatment and precautions; although without them there is little hope of cure.

H. G. BROOKE, 1899.
J. M. H. MACLEOD, 1911.

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## PARAPSORIASIS (BROCQ) OR RESISTANT SCALY ERYTHRODERMIAS

By J. M. H. MACLEOD, M.D.

WITHIN recent years a number of cases of psoriatiform and lichen-like eruptions have been reported under different headings which do not conform to psoriasis, lichen planus, or to any of the ordinary recognised types of skin disease, and which, though differing in minor details, have so many essential features in common as to warrant their inclusion in one group. For this group Dr. Colcott Fox and I in 1901 suggested the non-committal but descriptive title of "resistant maculo-papular scaly erythrodermias," and in the following year Brocq, who regarded them as closely related to psoriasis, gave to them the simple name of "parapsoriasis." Neither of those headings is wholly satisfactory; as regards the first, there are certain cases, though few in number, clearly belonging to this group in which maculo-papular elements are not a characteristic feature; whilst as regards the title "parapsoriasis," the relation to psoriasis does not appear to me to be sufficiently close to warrant the use of a name which suggests an aberrant form of a common disease.

According to the type and arrangement of the lesions Brocq has divided the group into three varieties, namely, parapsoriasis en gouttes, P. lichenoïde, P. en plaques. This division is so convenient that it will be adhered to in the following description. Before discussing the varieties and referring to the different cases which should be included in the group, it will be advisable to describe the pathological and clinical characteristics which are common to all its members.

**Etiology and Pathology.**—The cause and true nature of this group of skin affections are unknown. They seem to occur chiefly in adults, and are probably more common in the male sex. They may occur in all classes, and in one or two instances have been met with in men exposed to high temperatures, such as furnace-men (Crocker) and firemen (J. C. White), but to what extent the heat was responsible for the eruption is doubtful. Brocq considers that they are closely allied to psoriasis in their patho-

genesis, but this does not advance matters much, as the pathogenesis of psoriasis is not understood. The histological features common to all the members of the group suggest that the primary changes occur in the blood-vessels, and that the epidermic changes are secondary and result from oedema; the cause, however, of the vascular changes is unknown.

**Histo-pathology.**—Histological changes are present both in the epidermis and the corium. In the corium the most marked feature is a dilatation of the superficial capillaries of the papillary and sub-papillary layers, associated with a cellular infiltration around the dilated vessels, and oedema and rarefaction of the connective tissue in the neighbourhood. The papillary body itself is flattened out so as to form an undulating line where it meets the epidermis. No proliferative changes are present in the capillary walls, but simply a dilatation such as might be produced by congestion in the deeper veins. The collagen bundles around the dilated capillaries are oedematous, structureless, stain badly, and here and there are broken up into their component fibres. The elastin is also affected and swollen, but not to the same extent as the collagen. The cellular infiltration consists chiefly of lymphocytes. The corium below the sub-papillary layer appears to be normal, and no changes can be detected about the pilo-sebaceous follicles or the sweat glands.

The changes in the epidermis appear to be secondary to those in the superficial layer of the corium and to result from the oedema. The inter-papillary processes are scarcely noticeable. The basal layer is blurred from oedema and the presence of leucocytes between the cells. The prickle-cells are swollen, stain indifferently, and the nuclear spaces are dilated sometimes with nuclei lying free in them. The inter-epithelial lymphatic spaces are oedematous, the inter-epithelial fibrils are stretched, but not broken, to form a vesicle, and leucocytes may be noted between the prickle-cells. The granular layer is absent in some places and defective in others, but where the oedema is not marked it may appear to be normal. The stratum lucidum is absent. The stratum corneum varies like the granular layer, and appears to be normal where the granular layer persists, but shews evidences of parakeratosis, with persistence of the nuclei and a tendency to form scales, where the granular layer is absent or defective.

**Symptoms.**—The eruptions are of a superficial inflammatory character, with an almost complete absence of infiltration. The essential lesion is in most cases a macule or maculo-papule, round, oval, or angular in outline, and either smooth on the surface like a papule of lichen planus or covered by a fine adherent scale. By the peripheral spreading and coalescence of these initial lesions in different fashions the three main varieties—the guttate, the retiform, and the patchy—are produced. In the first of these the initial macules develop into guttate lesions; in the second they are arranged in a peculiar marbled or reticulate manner; and in the third variety circumscribed, sharply defined patches occur, from one to three inches in diameter, the manner of evolution of which is uncertain. These lesions vary in tint from a pinkish-fawn colour to

a pale red, and are darker on the extremities than on the trunk. There is more or less fine scaliness present. The eruption is distributed chiefly on the trunk, arms, and legs, more rarely on the backs of the hands and dorsa of the feet. It is absent from the scalp and face. There are no subjective symptoms associated with it, except slight itchiness from excessive heat, and it does not seem to affect the general health in any way. The evolution of the eruption is slow, its duration long, and it is extraordinarily resistant to treatment; local applications, which would remove the lesions of psoriasis and seborrhoeic dermatitis in a comparatively short time, having little or no effect upon it.

**Varieties.**—(I.) *Guttate Variety* (Parapsoriasis en gouttes of Brocq) in which the lesions are allied to psoriasis. The eruption consists of macules or maculo-papules varying in size from a pin-head to a threepenny piece, and either smooth and shiny or covered by a fine adherent scale, which is but little noticeable except after scratching the surface of the lesion, when it becomes pearly, or by a more marked yellowish scale which is more easily detached. The lesions suggest in appearance those of a secondary syphilide without infiltration. They are reddish in tint and are chiefly found on the trunk and proximal parts of the arms and legs, over which they are irregularly disseminated. They are absent from the face, scalp, and hands. There is little or no pruritus associated with the eruption. The evolution of the eruption is slow, and it is singularly resistant to treatment. Cases conforming to this type have been reported by Jadassohn under the headings of "dermatitis psoriatiformis nodularis" and "a peculiar psoriatiform and lichenoid exanthem," by Eudlitz as "psoriasis en gouttes d'aspect syphiloïde," and by Juliusberg as "pityriasis lichenoides chronica."

(II.) *Retiform Variety.*—(Parapsoriasis lichenoïde). The lesions are intermediate between psoriasis and lichen planus. The eruption has a peculiar mottled appearance, caused by the essential lesions coalescing to form a pinkish or reddish network enclosing areas of normal skin. The meshes are comparatively regular in size, averaging 2 to 3 inches in diameter, and are roughly polygonal in shape. The network resembles the retiform patterning which may be seen in erythema ab igne on the shins, and on the limbs of fat infants exposed to cold. If to a retiform patterning such as these there be added a superficial inflammatory condition affecting the meshwork but not the enclosed meshes, accompanied by the formation of macules and flat papules covered with fine scales, the peculiar picture of this dermatitis is suggested. The essential and component lesions consist of round or oval macules or flat papules, over which the epidermis is either stretched as in lichen planus or is in the form of a scale. In tint the lesions vary from yellowish-pink in the upper parts of the body to bluish-red on the extremities from venous engorgement, which is most marked on the forearms, legs, and backs of the hands. The venous engorgement produces a peculiar variegated livid appearance. On the extensor aspects of the limbs the network is coarser than on the trunk, scaliness is more marked, and the papular elements are more prominent. The skin of the

palms may be thickened and fissured from hyperkeratosis like chronic eczema. The scalp may be scurfy and the hairs tend to fall out, but this is possibly the result of the association of the affection with pityriasis alba of the scalp. The nails are not affected. There are no definite

Fig. 79.—Parakeratosis variegata. (T. Colcott Fox and MacLeod.)

subjective symptoms unless the patient be exposed to a high temperature, when the eruption becomes slightly itchy and redder in colour. The eruption develops slowly, is very chronic in its course, being subject to spontaneous exacerbations and remissions, and is little affected by treatment.

To this variety belong the cases entitled parakeratosis variegata by Unna, Santi, Pollitzer, Colcott Fox and MacLeod; and lichen variegatus by Crocker. Sir Erasmus Wilson designated it as lichen planus retiformis

in naming a model by Baretta which he presented to the Museum of the Royal College of Surgeons.

(III.) *Patchy Variety* (Parapsoriasis en plaques of Brocq) allied to the psoriatiform variety of seborrhoeic dermatitis. The eruption takes the form of patches varying in size from 1 to 4 inches in diameter, and roundish or irregular in shape. The patches are more or less well defined, and vary from a fawn or yellowish colour to a reddish-brown or *café au lait* tint. The eruption is chiefly present on the trunk and limbs, and does not as a rule involve the face and scalp. On the trunk the patches are smooth or slightly scaly and are not elevated, but slight infiltration may be present. On the legs the scaliness is well marked. The manner of evolution of the patches is uncertain. Some of them suggest the coalescence into patches of macules or small maculo-papules; others, except for slight accentuation of the normal furrows in the skin, might be produced by a uniform inflammatory disturbance over the whole lesion. The scalp and nails are not usually affected. The eruption, like that of the previous varieties, is of long duration, and equally resistant to treatment. To this variety belong the cases described as "érythrodermie pityriasique en plaques disséminées" by Brocq, J. C. White, and others, and probably those named "xanthoerythrodermia perstans" by Crocker.

**Diagnosis.**—The differential diagnosis of this group of cases may present considerable difficulty in the first and third varieties, but in those of the second or retiform type it is comparatively easy. The diagnostic features of the eruption are the slowness of the evolution of the lesions, their chronicity, their extraordinary resistance to local treatment, and the absence of subjective symptoms. The affections with which it is most likely to be confused are psoriasis, seborrhoeic dermatitis, lichen planus, and, in a few rare instances, with secondary scaly syphilides.

*From psoriasis* cases of the guttate and patchy varieties differ in that the initial lesion is dissimilar; it is less bright in colour, its scales are not silvery and are more adherent, and when scratched off do not leave a shiny film with haemorrhagic puncta as in psoriasis. The seats of election of psoriasis are not more involved than other situations, and the scalp, which is so commonly affected in psoriasis, is free. The eruption is much more persistent than psoriasis, and far more resistant to treatment. Histologically there are several marked differences of which the flattening of the papillary body is one of the most noticeable, whereas in psoriasis the papillae are usually prominent and elongated.

*From lichen planus* the initial lesions may be distinguished by being less prominent and infiltrated, not violaceous in tinge, never umbilicated, and generally scaly, and by the absence of subjective symptoms.

*From seborrhoeic dermatitis* of the psoriatiform type considerable difficulty may be experienced in differentiating cases of the patchy variety. Seborrhoeic dermatitis has, as a rule, greasy whitish-yellow scales, frequently occurs on the face, scalp, and inner surface of the joints, is usually slightly itchy, and is most amenable to local treatment; whereas

in this group the scales are dry, whitish, and often adherent, the face and the scalp are not attacked, there is practically no itchiness, and it does not respond to anti-seborrhoeic treatment.

*From secondary syphilides* it is easily distinguished by the absence of infiltration.

The **prognosis** varies considerably in different cases. In the widely distributed reticulate variety it is extremely bad, and neither local nor general treatment seems to have much effect on it. In the guttate and patchy varieties improvement and even cure may be obtained by the thorough application of strong local remedies.

**Treatment.**—As the etiology and pathogenesis of this disease are unknown, the treatment is purely empirical. As it usually occurs in those who are apparently in good health, there is as a rule no definite indication for general treatment, but any existing defect should be corrected as far as possible on general principles. The internal remedies which have been used with greater or less success in psoriasis and lichen planus have been tried in this group of diseases, but without any marked benefit. Arsenic, either by the mouth or injected in the form of the organic preparations, and salicin have been tried, but have not produced any distinct improvement.

Locally the comparatively mild keratolytics which are capable of curing seborrhoeic dermatitis and of greatly benefiting psoriasis, such as ichthyol, resorcin, and sulphur, have little or no effect on these eruptions, and stronger remedies are necessary. In the guttate and patchy varieties benefit can be derived from the rubbing in of an ointment containing pyrogallic acid, and a formula such as the following will be found useful:—℞ oxidised pyrogallol ♏x. to xxx., glycerin of starch ʒii., vaseline to ʒi. This ointment may be further enforced by the addition of 2 per cent of salicylic acid. After a bath and the removal of the scales by soft soap this ointment should be rubbed into the individual lesions. When the disease is very extensive, as in the reticulate variety, this procedure is contra-indicated, as it might lead to absorption of the drug and the production of toxic symptoms. When pyrogallic acid is used extensively the urine should be tested frequently, and directly any discoloration due to the drug is noticed the treatment should be stopped at once. In place of pyrogallic acid Crocker recommended vasogen-iodine 10 per cent, to be thoroughly rubbed in for ten minutes; this is much less toxic in its action and is quite as effective. The *x*-rays may be employed in the treatment of isolated patches and with considerable success. About three-quarters of a Sabouraud-pastille dose should be enough to produce fading of the patch; if this be insufficient a second exposure may be given in a month.

In the widely distributed reticulate cases of the parakeratosis variegata type vigorous remedies are dangerous and apt to set up by their irritation an exfoliative dermatitis. Consequently in such cases it is advisable to be content with milder measures, and to aim rather at keeping the skin comfortable than at wiping out the eruption, in the hope that the disease

will eventually disappear spontaneously. For this purpose warm alkaline baths and soothing applications, such as resorcin gr. xxx. or salicylic acid gr. x. in an ounce of glycerin of starch, will be found most serviceable.

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# PITYRIASIS ROSEA

Synonyms.—*Pityriasis rosé* (Gibert); *Herpes tonsurans maculosus* (Hebra).

By H. G. Adamson, M.D., F.R.C.P.

Pityriasis rosea is a benign and somewhat common affection with distinct and constant features; but its nature is at present obscure. It is of practical importance in that it is liable to be mistaken for other diseases, particularly for syphilis, by those unfamiliar with it.

Gibert, in 1860, first gave a good description of the disease, and differentiated it from other affections with which it had been confused. It has since been described under various names, each of which indicates some of its main characters. Bazin, in 1862, called it "pityriasis rubra aigu disséminé"; Hardy, in 1818, "pityriasis disséminé"; Horaud, in 1875, "pityriasis circiné"; Vidal, in 1877, "pityriasis circiné et marginé"; Duhring, in America, in 1880, "pityriasis maculata et circinata." Besnier called it "pseudo-exanthème érythémato-desquamatif." Dr. Colcott Fox first drew attention to the disease in this country in 1894, and quoted Gibert's account of the affection as establishing his claim to have been the first to describe it. In Vienna this affection has long been known as herpes tonsurans maculosus, Hebra having described it in 1876 under that name as a form of ringworm of the body. At the

present time most German and Austrian dermatologists admit that it has no relation to ringworm, and the use of the name pityriasis rosea has now become almost universal.

**Etiology.**—The cause of the disease is unknown. The majority of observers have been unable to discover any micro-organism in the lesions. Vidal described a minute fungus, which he named *Microsporon anomoeon*; but this observation has not been confirmed, and some writers regard Vidal's "pityriasis marginé" as a distinct affection, Darier classing it as a "seborrhoeic dermatitis." Although not holding the view that pityriasis rosea is a form of ringworm, Finger, in Vienna, still clings to the belief that it is due to a fungus, and argues that it is seen particularly in persons whose inner garments become damp from perspiration, and in those who have slept in damp beds or in damp dwellings. He states also that Oppenheim has found in the scales of many of his cases rather large, oval, or angular spores without nuclei, sometimes more, sometimes less, abundant. Lassar believed that the wearing of new under-garments was an important factor in the etiology. Jacquet and Besnier believe that dilatation of the stomach is common in these cases. A review of the etiology of this affection would be incomplete without reference to these opinions, but they are opposed to the experience of the majority, and commonly no antecedent etiological factor can be discovered.

Many observers incline to the belief that the disease is exanthematous in nature. The manner of evolution and the spontaneous disappearance of the rash suggest this. The occurrence of the affection in waves or epochs, as in many exanthems, and the fact that a second attack is unknown or, at any rate, rare, are also features of an exanthem. There is, however, little evidence that it is directly contagious, although there are on record instances of two cases in one family at the same time. Out of 4000 cases attending the skin department of St. Bartholomew's Hospital, during 1910, 45 cases, or more than 1 per cent, were pityriasis rosea, of these 30 were females and 15 males. They were of all ages, from two years to sixty years. The disease therefore is not rare.

Some authorities have thought that there is a close relation between certain forms of pityriasis rosea and eczema seborrhoeicum. Besnier, in 1889, wrote on the analogy which exists between certain cases of pityriasis rosea of Gibert and seborrhoeic eczema. Brocq more recently discussed the relation between these affections, and described what he regarded as "intermediary eruptions." But, although there may be cases which clinically resemble seborrhoeic dermatitis, and although there is a resemblance between the histological features of these two affections, the absence of micro-organisms in the one, and their presence in the other, point to a difference in etiology which seems to forbid the conception of these eruptions as closely related affections.

The **morbid anatomy** of pityriasis rosea has been studied by Darier, Unna, Oro and Moira, Blaschko, Hollmann, and Sabouraud, and there is in the main an agreement between the various descriptions. The changes in the corium consist in a dilatation of the vessels of the superficial

plexus, with perivascular cell infiltration; and Hollmann, who examined lesions in different stages, states that the process begins in this way. The epidermis shews a not very marked spongioid oedema of the upper part of the prickle-cell layer, with a resulting parakeratosis of the horny layer and absence of the granular layer. The vascular dilatation and the parakeratosis correspond respectively with the clinical appearance of redness and scaliness. In more advanced lesions Unna, Hollmann, and Sabouraud have described microscopic vesicles, which to the naked eye are invisible. Sabouraud found them only at the spreading margin or more active part of the lesion. The vesicles are sparse, and they are situated quite superficially in the horny layer. They represent, of course, a further stage of oedema beyond that which is sufficient to produce parakeratosis. It has been noted by Blaschko and by Hollmann that these vesicles often enclose epithelial cells which are swollen and fused together.

All are agreed that micro-organisms are absent, and Sabouraud has pointed out that the vesicles contain mononuclear but not polymorphonuclear leucocytes, an observation which "tends to make one believe that the absence of microbes in pityriasis rosea is not only apparent but real." Both Unna and Sabouraud, while comparing the histological appearances of the lesions of pityriasis with those of "seborrhoeic eczema," lay stress upon the absence of micro-organisms from the one and their presence in the other.

**Clinical Features.**—The affection is usually seen in children and young adults. Some observers state that it is more common in children than in adults, and in females than in males, but many will probably agree that it does not shew any preference in these respects. The patient generally comes for treatment with the eruption fully developed. There are rounded, pale red, slightly scaly patches varying in size from that of a split pea up to that of a shilling, distributed thickly, without being confluent, over the trunk and extending for a short distance on to the neck, and a little way on to the arms and thighs, but rarely beyond these limits. This distribution, in what may be called the "vest area," is one of the most striking features of the eruption in the majority of cases (Figs. 81, 82). At the sides of the trunk the patches are usually oval, with their long axis downwards and forwards, that is, in the direction of the "lines of cleavage." Oval patches may also be seen radiating from the axillae. The patient's history shews that the eruption has developed rapidly, but on inquiry it is generally found that one patch, usually larger than the rest, has appeared some days before the general eruption. The occurrence of this early patch was first pointed out by Brocq, who called it "the primitive plaque."

*The primitive plaque* of Brocq, *mother patch* of Besnier, or *herald patch* is usually situated on the upper part of the trunk near the neck, on the neck, or on the upper part of the arm; less often on the lower part of the abdomen or on the upper part of the thigh. As a rule, there is but one primitive patch, but there may be two or three or, rarely, more. It

begins as a pinkish or pale-red circumscribed macule, which quickly becomes covered with very fine scales, which give it a yellowish tinge, except just at the margin, where it remains smooth and pink. The patch rapidly expands, and, as it does, fades in the centre, so that soon it consists of a circinate or ring-like band, pink at its outer edge, red, slightly raised, and scaly at its inner part, and enclosing a central non-scaly, fawn-coloured, finely wrinkled area. It becomes what has been called the circinate type of lesion—pityriasis circinata (Fig. 80).

*The Secondary Eruption.*—Generally the patient takes little notice of the early patch, but becomes alarmed when, some four to eight days

FIG. 80.—Pityriasis rosea, shewing the "herald patch" before the general eruption. The "herald patch" or primary plaque seen just beneath the right clavicle is here circinate. The macular eruption is just appearing.

later, the secondary eruption bursts out and rapidly spreads over the trunk. This consists at first of macular lesions like the early stages of the primitive patch, of the size of a pin's head up to that of a small coin, pink or red and slightly raised, the large ones very soon becoming covered with fine yellowish scales, except at their extreme margins, which remain smooth and red. When the rash is fully developed, the whole trunk, and the neck and the upper parts of the limbs, may be thickly covered with these scaly macules (Fig. 81). In other cases the macules cover the same area, but more sparsely (Fig. 82). In the course of a week or two, many of the macules may increase in size to form large discs, while others fade at their centres to form circinate lesions, so that the eruption may consist of a mixture of macular and circinate patches. In some cases, generally when the eruption is sparse, the majority of

macules may become circinate (pityriasis circinata, Fig. 83). More commonly the whole of the eruption remains in the macular stage (pityriasis maculata), the only circinate lesions being the primary patch or patches. The secondary eruption usually persists for from four to eight weeks. The lesions eventually become pale, lose their scales, and finally disappear. The eruption may sometimes last for several months. It is

FIG. 81.—Pityriasis rosea. A characteristic macular eruption, with the characteristic distribution in the "vest area."

not infrequently accompanied by troublesome itching, especially in its earlier stages. Some writers, Besnier in particular, have described slight febrile symptoms, with sore throat, enlargement of the glands in the neck, and general malaise, before the secondary eruption; but these premonitory symptoms are rare.

Scraping the surface of a macule or the margin of a circinate patch with the nail or with a sharp instrument removes the scales, and thus exposes a smooth red surface, which shews sometimes purpuric spots and sometimes fine wet glistening points. There is not the continued renewal

of scales nor the final production of bleeding points as when a psoriasis patch is scraped. Brocq was the first to describe this result of scraping, as a criterion between the lesions of pityriasis rosea and those of psoriasis.

A departure from the ordinary type of eruption is sometimes seen in which the macules or circinate patches are limited to a particular region, notably to the shoulders and neck, or to the abdomen and thighs (Fig. 84).

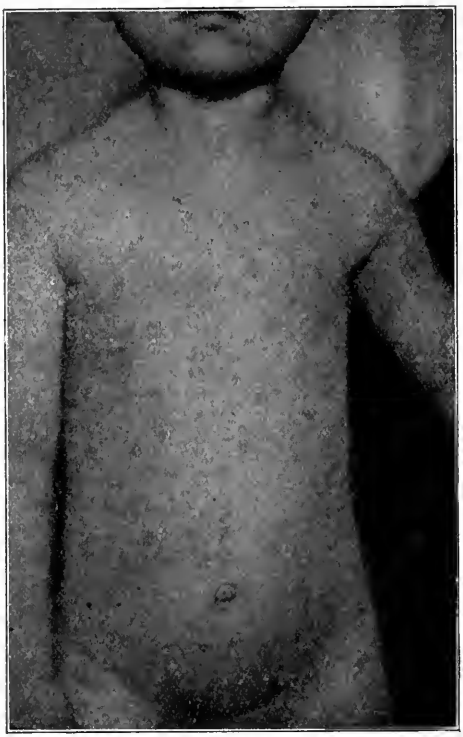

Fig. 82.—Pityriasis rosea ; macular type with sparse lesions.

In other cases the eruption may extend beyond the usual limits and invade the face, the arms, and the legs (Fig. 85). In children it is not unusual for it to extend up the neck on to the sides of the face and even on to the scalp (Fig. 86). In cases in which the eruption appears upon the arms and legs, the lesions frequently become markedly scaly or even crusted in these parts, so that they may simulate psoriasis or a patchy form of eczema. A rare form of the eruption is that which has been described by Vörner as pityriasis rosea urticata, and by Hallopeau as "une forme ortiée de pityriasis rosé," in which the lesions swell up like urticarial wheals and are accompanied by intense itching.

It is curious that Gibert, in his classical description of the disease, did not mention the circinate type of lesion. Hebra, on the other hand, in his account of herpes tonsurans maculosus described very accurately both the early macule and the later circinate lesion, and also shewed that the latter was a further stage of development of the former.

**Diagnosis.**—The appearance of the lesions, their characteristic distribution, and the mode of evolution of the eruption are so striking that recognition of this disease is easy if it has once been seen ; but it is commonly mistaken for other affections by those unfamiliar with it. As Fournier has truly remarked, the disease is known only in the small world of dermatologists ; it is not yet recognised by the great medical public. The eruptions with which it is more often confused are ring-

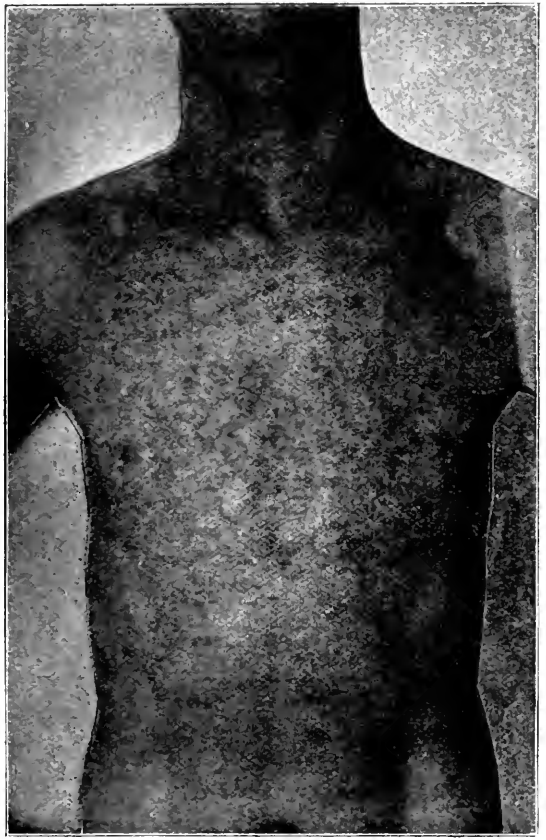

FIG. 83.—Pityriasis rosea. A well-marked example of the less common circinate type.

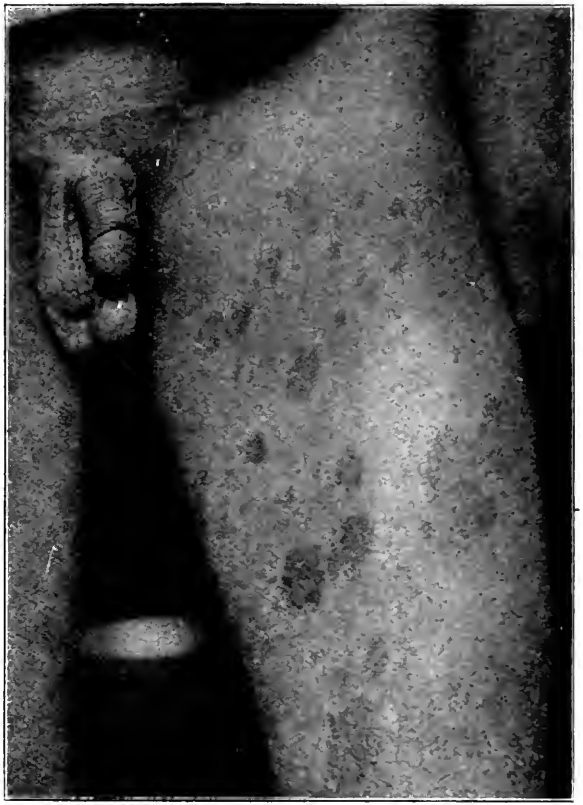

FIG. 84.—Pityriasis rosea in a boy. The eruption is limited to the lower part of the abdomen and the thighs.

worm of the body, the roseola of syphilis or an early papular syphilide, seborrhoea corporis, and psoriasis. It is for syphilis particularly that it is so often mistaken.

From *ringworm* of the body it is distinguished in that in ringworm the patches are never so numerous nor so regularly distributed over the characteristic seats of the eruption of pityriasis rosea. A localised eruption of pityriasis rosea may be more difficult to diagnose from ringworm, but the absence of the fungus in the scales will exclude the latter.

FIG. 85.—Pityriasis rosea. A very extensive eruption on the arms and legs. The photograph is too small to shew the individual lesions, which were very thickly set, but the distribution is well seen.

Pityriasis rosea is to be distinguished from the early *roseola of syphilis* by the fact that the macules are scaly in the former but never in syphilis. The presence of the primitive plaque or plaques, and, often, of some itching, are other features of pityriasis rosea. And other manifestations of syphilis are absent. The essential point, however, is that syphilitic roseola is never scaly. The absence of any decided infiltration in the skin should at once distinguish pityriasis rosea from a scaly papular syphilide.

In *seborrhoea corporis*, or "flannel-rash," the eruption is generally confined to the central parts of the back and chest or to the flexures. The lesions are more infiltrated and the scales thicker and more greasy in appearance, and the scalp is affected with seborrhoea corporis. Careful inspection will shew that the lesions are in reality not macules, but that they are made up of flat scaly papules, often especially prominent towards the margin of the lesion.

As regards *psoriasis*, it is only for an acute generalised type of this eruption that pityriasis rosea could be mistaken, and the absence of the characteristic mica-like scales on scraping the lesions would exclude this disease.

**Treatment.**—Although the eruption disappears spontaneously in most cases in from three to six weeks, it is generally agreed that a cure can be brought about more rapidly by local treatment. A simple plan is for the patient to remain in a warm bath daily for twenty minutes, and afterwards to anoint the body with an ointment containing salicylic acid 15 gr. to ℥i.; a weak sulphur ointment or a combination of sulphur and salicylic acid is also recommended. Crocker advocated salicin

internally, 15 gr. three times a day. Sometimes a lotion may be required to allay itching, such as biborate or bicarbonate of sodium ʒi.-ʒij. to ℥viii. of water with a little glycerin; or liq. carbonis detergens

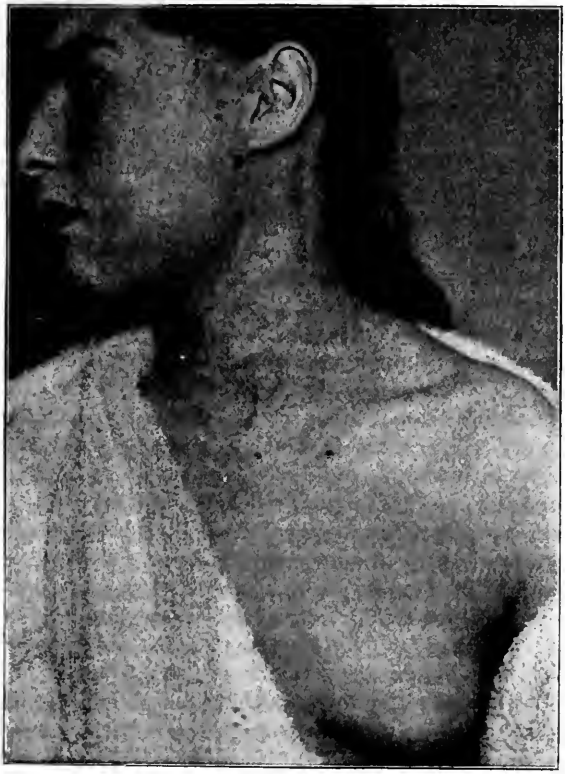

FIG. 86.—Pityriasis rosea. In this patient the eruption was typical on the trunk. In the photograph some macules can be seen radiating from the axilla. It was peculiar in that the eruption extended on to the neck and face, the macules there becoming confluent in parts.

ʒi. and liq. plumbi subacet. ʒj., in ℥viii. of water. A method of soft soap inunctions twice daily for six days was used by Kaposi in order to produce desquamation. But this treatment was employed because the disease was thought to be ringworm, and it may now be discarded as unnecessarily severe. H. G. ADAMSON.

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# LICHEN

By H. G. Brooke, M.B., Revised by J. M. H. MacLeod, M.D.

**Definition.**—The name "Lichen," originally applied to those diseases which seemed to spread on the skin somewhat as the cryptogamic lichens do on trees and stones, has led to considerable confusion. The special group of skin diseases which it was supposed to designate was that in which the elements of the eruption were exclusively and permanently papular. Unfortunately this restriction in usage was not strictly adhered to, and the name came to be loosely applied to eruptions in which papules did not remain as such but became vesicles or pustules. In consequence the name lichen, qualified by a distinctive adjective, has been used to denote a large number of skin affections which differ from each other not only in their clinical appearances but in their etiology and pathogenesis. Since Hebra's time the employment of the name has become gradually more restricted, and at present it is only applied to a few skin affections in which the initial lesion is an inflammatory papule, the most important of which being lichen planus of Erasmus Wilson. When used alone the name now conveys no special indication of the nature of the disease to which it is applied.

**History.**—In the Hippocratic writings the word "lichen" is used exclusively to signify papular eruptions; yet by many later Greek writers and their translators it was employed to designate not only papular eruptions, but also some which contained pustular lesions. Although Celsus pointed out that the papula agria was changed into impetigo by neglect or improper treatment, the confusion between the papular lichen eruptions and pustular diseases was continued by writers in every country, even down to the days of Plenck; and such varied and distinct diseases as scabies, sycosis, and even herpes, were included in the lichen group. This association was probably the result of an unconscious attempt to include them all under one etiological heading, the Hippocratic school having attributed to the lichens the power of purging the body from vicious humours, a function for which the pustular eruptions were also supposed to be designed.

Willan, in order to obviate this confusion, returned to the original sense of the word as used in the school of Hippocrates, and defined lichen as an extensive eruption of papules affecting adults, which was connected with internal disorder, usually terminated in scurf, was recurrent and not contagious. He divided the lichens into six varieties: *L. simplex*, *L. pilaris*, *L. circumscriptus*, *L. agrius*, *L. lividus*, and *L. tropicus*. To this very Linnaean classification many additions have been made by subsequent writers. Hebra first tried to introduce some order by restricting the term to those maladies which are characterised by papules which

complete their evolution as papules—without changing into other lesions, such as vesicles or pustules. Unfortunately, he did not adhere strictly to his own definition, for he included in his group not only lichen ruber (acuminatus and planus), in which the eruptions in their typical form are purely papular, but also L. scrofulosorum, the elementary lesions of which may become pustular.

Since his time the process of elimination has gone continuously forward, and furnishes a somewhat humiliating exposition of the periods of painstaking and laborious blundering through which clinical observation may have to pass before it rectifies the errors implied in the traditional use of an old name.

It will be well in the first instance to indicate those of the so-called lichens which by general consent have now been relegated to other groups of disease, to which they more rightly belong. Such are:—

*L. agrius* a severe papular eczema, later becoming vesicular. According to Vidal it was used to indicate what Hebra afterwards described as prurigo. *L. annulatus*, *L. circinatus* are seborrhoea corporis. *L. circumscriptus* is referred to by Vidal and Brocq as the equivalent of L. simplex chronicus, and in certain cases is L. planus. As represented in Willan and Bateman's atlas it is seborrhoea corporis. *L. gyratus* is also a form of seborrhoea corporis (Crocker). *L. hypertrophique* (Hardy) is mycosis fungoides. *L. haemorrhagicus* consists of small papules due to haemorrhage at the mouths of the hair follicles. *L. lividus* is a name which has been applied to papules in different diseases in which slight haemorrhage has occurred. *L. menti* is sycosis. *L. scrofulosorum* is a tuberculide. *L. serpiginosus* is seborrhoea corporis. *L. simplex* is a title applied to the papular stage of different eruptions such as eczema, prurigo, urticaria. *L. strophulosus* or *Strophulus* is a name which has been given to several cutaneous affections in infants, in which inflammatory papules occur, such as miliaria rubra ("red gum"), papular urticaria (strophulus prurigineux). *L. syphiliticus* is the small papular or miliary syphilide. *L. télangiectasique* is angiokeratoma. *L. tropicus* is "prickly heat." *L. urticatus* is papular urticaria. *L. variegatus* (Crocker) is the parakeratosis variegata of Unna, and is a peculiar resistant scaly dermatitis in which the maculo-papules are arranged in a network enclosing areas of normal skin.

The various forms of eruption described by Vidal, and his pupil Brocq, as *L. simplex*, *acute* and *chronic*, *L. polymorphe*, *mitis*, and *ferox*, need not be dealt with here, as the application of the word to such diverse papular lesions has been rejected by the leading French dermatologists. Brocq has since placed them in the group of prurigos, but classifies them, in order to prevent confusion, as forms of neurodermatitis.

There are two other conditions to which the term is still applied, namely, *L. pilaris* and *L. nitidus*.

1. *L. pilaris*.—According to Willan, this was a form of lichen simplex affecting the hair follicles, accompanied by troublesome itching or tingling lasting about ten days, and then fading and leaving a slight desquamation. Bazin and all other later writers have uniformly used the

name to signify the rough, scaly plugs which often project from the hair follicles, especially on the extensor surfaces of the upper arms and thighs. It is certainly not a lichen, but a form of keratosis of the upper part of the follicle, causing retention of the hair. Crocker, who recognized this, unfortunately applied the name to the L. spinulosus of Devergie which he regarded as being inflammatory in origin. *L. spinulosus* is a peculiar keratosis of the hair follicles, leading to the formation of thin rod-like horny plugs which project even as much as an eighth of an inch from the surface. This is distinctly a follicular keratosis, and not a lichen in which the inflammatory changes, if they are present at all, are slight and are probably secondary to the hyperkeratosis and due to irritation (Adamson).

2. *L. nitidus.*—Pinkus in 1897 applied this name to a peculiar eruption which closely resembles L. planus. In 9 cases which he described, it occurred in men suffering from venereal diseases, and was usually confined to the penis, but occasionally involved other parts such as the abdomen, chest, and arms. It consisted of small shiny papules and nodules, which on the glans penis looked not unlike small sago-grains. They were about the size of a pin's head or slightly larger, had a rounded surface, in the centre of which was usually a depression, and a transparent appearance like a granuloma. These papules tended to be arranged in rows, and though very numerous and close together they never became confluent. There were no symptoms associated with it, and the patients were as a rule ignorant of its existence till it was pointed out to them. Histologically the papule mainly consisted of a dense cellular infiltration of the granulomatous type, situated in the papillary and sub-papillary layers of the corium. The overlying epidermis was thin and shewed evidence of parakeratosis, but at the sides of the cellular mass it had proliferated and grown down in long processes. The infiltration was made up of small round cells like lymphocytes, epithelioid cells and giant cells. Near the epidermis there were signs of degeneration with the formation of a microscopical abscess. The collagen in the infiltrated area was in a state of oedematous degeneration and the elastin was defective. From L. planus the affection differed in that the lesions had the transparent appearance of granulomas, were all of the same type, left no pigmentation on fading, and were not associated with subjective symptoms. A case occurring in a woman suffering from Bartholinitis was described by Kyrle and M'Donagh, in which a positive general reaction was obtained after an injection of 1 mgrm. of Koch's old tuberculin. On this account, combined with the histological appearances, the possibility of a tuberculous origin was suggested, but an examination of the tissue for tubercle bacilli and injections into a guinea-pig gave negative results.

**Lichen ruber.**—The exact nature of the disease to which Hebra originally gave this name is at the present time unknown; for, although his account of it is clear, it is impossible to identify it with any similar condition known to dermatologists in these days; and in his later years

he himself seems to have had no further cases to record. According to his original description (1860) it is essentially a lichen; that is, it consists of papules which remain unchanged throughout their whole course, and do not become converted into vesicles or pustules. These papules are red, minute, not excoriated, and covered with a few minute red scales. They are not collected into groups, nor scattered over the whole surface of the body, but they are generally confined to certain parts, especially on the limbs. The papules remain of the same size throughout the whole course of their existence, but become so closely packed together that they finally come into actual contact, and form continuous patches of variable size and shape, which are red, infiltrated, and covered with thin, paper-like, not very adherent scales. These patches may so extend as to cover the whole surface of the body, and the integument is then universally reddened, covered with numerous thin scales, and so infiltrated that when a fold of the skin is taken up it is found to have more than twice the normal thickness. When the scales are picked off, the apertures of the hair-sacs are seen to be dilated. There is no oozing, and the patches do not bleed when gently scratched. When the disease is extensive the itching may be very disagreeable, but is by no means proportionate to the severity of the complaint; and the excoriations are never well marked. The movements of the parts affected are much interfered with, particularly of the hands and feet; and deep bleeding rhagades form over the articulations. In extensive cases the nutrition of the nails is greatly interfered with, either by an increased growth from the bed of the nail, and discoloration and brittleness of its substance, or by cessation of the growth over the nail bed, and formation of a brittle horny plate projecting upward from the matrix. The hair of the scalp, pubes, and armpits remains unaffected, but that on the other parts of the trunk is not well developed. The state of the general health depends upon the extent of the cutaneous affection; at first, when the patches are scanty, the functions go on normally, but as the eruption increases in quantity the nutrition of the body begins to decline. The patient may eat and sleep well, but loses his subcutaneous fat by degrees; and, later, after the whole surface has become involved, marasmus sets in, and the case generally ends fatally; though it may be years before the end comes. Of Hebra's first fourteen cases, on which he based his description, twelve ended in death, one patient disappeared, and one only recovered completely; all were treated with arsenic.

This preliminary conception of the disease was modified subsequently; for during Hebra's lifetime (1877), and with his consent, Kaposi divided L. ruber into two classes: *L. ruber acuminatus*, which was to correspond with Hebra's original L. ruber, and *L. ruber planus*, which was the L. planus of Wilson. Speaking of L. ruber acuminatus as the equivalent of the old L. ruber, Hans Hebra says that the patient complains of great and general uneasiness, twitching of the extremities, and a burning and tormenting itching which disturbs his night's rest, renders his existence unbearable, and causes continuous scratching, so that it is not unusual

to meet with blood-stained spots. A characteristic feature of the affection is its speedy action in reducing even strong people. They quickly become prostrate and lose weight, due chiefly to sleeplessness and want of appetite; oedema appears, especially in the lower limbs, with fever and albuminuria; and the prognosis is necessarily of a serious character.

Such cases are of great rarity, and Kaposi, who had not seen Hebra's original patients, or indeed any other case of the same fatal character, considerably modified his teacher's description of the lesions. According to him, the papules range from the size of a millet seed to that of a pin's head, and are very hard, red, and conical, bearing at their summit a thick little hillock of epidermis, so that when closely packed together they feel like the prickles of a rasp. On account of Hebra's acceptance of this description it found its way into all the textbooks, but it remained a mystery why the disease with these well-marked horny papules had ceased to be fatal. Taylor of New York recognised the condition from the skin lesions, and, regarding it from Kaposi's description as Hebra's disease, denied that it had any connexion whatever with Wilson's L. planus. Besnier, who with his pupil Richaud (1877) had been restudying Devergie's pityriasis rubra pilaris, asserted (1889) that this affection is identical with Kaposi's L. ruber acuminatus, and to this identification Kaposi assented. But as P. rubra pilaris differs in many ways from L. ruber,—for example, in its anatomical structure, in its freedom from itching and from serious constitutional symptoms, and in not being improved but sometimes injuriously affected by arsenic,—how were the deaths of Hebra's patients to be explained? Either the type of the disease had changed, which was hardly possible in the time, or, as Hans Hebra, Neumann, and Unna assert, Kaposi was wrong in identifying L. ruber with Devergie's disease. Most probably, in the lapse of years since the last of the fatal cases, he had mistaken the P. pilaris for a slight non-fatal form of the original L. ruber type.

As von During suggests, it is most likely that Hebra himself in his original description (1860) confused three different diseases together: (i) the true lichen ruber with intense neurotic symptoms tending to a fatal issue; (ii) pityriasis rubra pilaris (L. ruber acuminatus of Kaposi); and (iii) cases of universal L. planus. Erasmus Wilson agreed with Hebra that L. planus was part of L. ruber; and Tilbury Fox (1873) had also identified them as modifications of the same affection; hence the change of name from L. planus to L. ruber planus, which was generally adopted both in this country and in Germany.

As pityriasis rubra pilaris, although first recognised in London, was little known in this country, and as L. planus certainly does not correspond to Hebra's description of L. ruber, it is obvious that both Wilson and Tilbury Fox must both have seen cases which resembled the latter affection sufficiently to allow of the identification. For Wilson was so convinced of the identity that he gave Hebra the priority of description; and Fox regarded L. ruber as a part of L. planus. Yet all the writers of

the last twenty years, in their unwillingness to doubt the word of such experienced observers, have had to accept the identification on trust. Only the French writers doubted it; they said they knew Wilson's disease well, but of Hebra's disease they knew nothing, and in all their vast material they could find no trace of it. Unna (1884), who had an opportunity of studying an epidemic of lichen in Hamburg, in 1881-82, was able to confirm Richaud's opinion (1884) that L. ruber acuminatus is not the same affection as P. rubra pilaris; and he met with several cases in which, as in Hebra's original cases, the pointed scaling little papules were present, accompanied with red desquamating infiltrated surfaces: the onset was acute, and preceded by general symptoms of itching, shivering, and aching. If treated at once it was readily arrested; but if untreated it spread gradually over the body, the skin became thick, hard, dry, and scaly, and after a few weeks the nails became affected, the hair fell out, and the patient became marasmic. In these he recognised clearly Hebra's original L. ruber, and the reason of his later acceptance of Kaposi's term *acuminatus* as applicable to the form of the lesions. Either Kaposi had never seen this form of lichen, or he had confused it with P. rubra pilaris. But as Unna had found the acuminate lesions in conjunction with those of L. planus and obtusus (an observation since borne out by H. Hebra, Boeck, J. C. White, Hallopeau, and others), he had no hesitation in recognising in it an acute and exaggerated form of the L. planus of Wilson. This recognition, indeed, was foreshadowed by Hebra and Kaposi in the later edition of the textbook (1874), for they state there, in distinction from the earlier account, that the papules may be either discrete or grouped, and rounded, umbilicated, brownish-red in colour, and having a wax-like shimmer; and Neumann, in upholding the distinction between Hebra's lichen ruber and Kaposi's lichen ruber acuminatus, speaks of the latter as lichen ruber acuminatus planus. It was probably the recognition of these slighter mixed cases which led Wilson and Tilbury Fox to pronounce for the unity of the acuminate and the planus forms. At the present time many, if not most, observers consider that Kaposi's L. ruber acuminatus is identical with Devergie's pityriasis rubra pilaris, an opinion which was practically established by the fact that when at the Dermatological Congress in Vienna in 1892, Kaposi on one side and Vidal, Hallopeau and other French dermatologists on the other, met over a case at the Buda-Pest Hospital, they claimed it respectively as lichen ruber acuminatus and pityriasis rubra pilaris.

We have thus come, by a laborious process of elimination, which it has taken a century to accomplish, to see that it is better to cease to apply the name "lichen" to an anomalous crowd of more or less papular affections, and to restrict it to one specific form of disease—that described by Erasmus Wilson in 1869 as lichen planus, of which Hebra's L. ruber is a rare and aberrant acute manifestation. This affection in the words of Besnier, is, "*le seul vrai lichen de l'heure présent, ou au moins le type de ce lichen.*"

LICHEN PLANUS is characterised by the eruption on the skin of small papules, which are polygonal in shape, covered with smooth, hard epidermis, red or bluish-red in colour, and burnished on the surface. They may remain discrete or become confluent, and either disappear with the formation of a brown pigmentation, or become covered with rough, hard masses of horny epithelium.

**Etiology.**—*Age.*—Lichen may occur at any period of life, from childhood to old age. It is doubtful if it occurs in infancy. The condition known as L. p. infantum, in which flat shining papules occur, usually in weakly infants, which disappear rapidly under treatment, though at one time thought to be L. planus is now known to be either papular urticaria (Colcott Fox), or the declining stage of miliaria rubra. It is very rare in childhood and youth, most common between 20 and 50, and after 60 it is again rare. Most of my cases have been between 30 and 50.

*Sex.*—My own experience is that in this country nearly half the cases are met with in women ; in the experience of others it is considerably more common in women, but Kaposi's figures shew that in Austria it is rather more frequent in men. The constitutional forms of the disease (L. planus acutus) are found almost exclusively in men.

There is as yet no precise indication of the direct cause of the outbreaks of the disease. Some observers regard it as a neurotic disease, at any rate in so far as the nervous system is interested in determining the course and distribution of the local lesions and the general symptoms; and yet, in very many of the cases, beyond a local itching there is no sign of any nerve symptoms whatever. Other writers believe that it is due to some toxin, the nature and origin of which is unknown, circulating in the blood and causing the eruption and at the same time producing the nervous symptoms associated with it, whilst others, again, consider that the eruption, in the subacute cases at least, is the result of scratching and rubbing to relieve a localised pruritus. No signs indicate the implication of any internal organ, even in the fatal cases; and no sequels result from an attack, however long or serious it may be. It does not seem to be in any way contagious or infectious, nor is there any evidence of microbic action. Although some patients are attacked when worried or in low condition, in the majority of cases, in my experience, the first signs come on when they are in good health, or without deviation from their ordinary standard. Hebra notes this fact about his fatal cases. In the acute generalised cases a chill in an individual who was overheated and perspiring has been known to be the determining factor of an attack.

Possibly there is some virus acting on the nerve-centres. This hypothesis would at any rate explain the suddenness of the attacks, the irritation, the liability to relapse, and possibly the tendency to recur in waves of greater frequency at intervals. Unna strongly believes in a parasitic origin, but, as is the case with psoriasis, we can hardly grant this supposition until more is known of the capacities and limitations of

the trophic influence of the nerves in the production of morbid alterations in the tissues.

**Morbid Anatomy and Pathology.**—The principal histo-pathological changes take place in the upper layer of the corium and papillary body, and in the epithelium; the difference of the forms assumed by the primary lesions of the eruption depends on the degree in which either the one or the other predominates, and on the structures (epidermis, sweat glands, hair follicles) more particularly concerned.

Although the first signs of the disease which can be detected clinically —namely, the flattening and burnishing of a very small area of skin— may appear before the slightest sign of hyperaemia can be detected, yet microscopical examination reveals changes in the vessels and connective tissue underlying the epidermis before any alteration of the epidermic cells is perceptible (Török). The first signs in the cutis are found in that portion of it which lies between the superficial network of blood-vessels and the epidermis—that is, the region of the papillae. The whole of this area becomes oedematous and closely packed with minute cells, whilst the larger part of the cutis underlying the vessels remains unaltered. This close restriction of the field of operation seems to be quite characteristic of the disease. The effect of this oedematous swelling is to dilate the papillae into various forms; they lose their irregularities and become pear-shaped or almost cylindrical, and as their sides are gradually pushed together, and the intervening portions of the papillary body are pushed up, the interpapillary ridges of epithelium are compressed and diminished by degrees into mere wedge-like streaks. This upward and lateral compression may go so far that the ridges are pushed out altogether, and the tightly packed papillae then form a solid cushion over which the epidermic layer lies stretched, but into which it does not enter. Owing to the absence of microscopical alterations in the character of the epidermic cells, it has been supposed that the smoothness and glossiness of the horny layers are due to the stretching of the epidermis over this underlying pad (Török), as is the case in rodent ulcer and in molluscum contagiosum. Doubtless this is an important factor in the process, but it can hardly be the only one, for, although the horny layer in the very early stage shews no signs of obvious alteration, yet likewise it shews no signs of very abnormal tension; moreover, a modification of the cornification process soon sets in, which is sufficient to explain the burnish of the fully developed papule; and the flat, shining surface is often the last sign to disappear from young papules which have been quickly arrested by treatment, and from which all signs of hyperaemia have vanished. Nor is the flat, glazed surface peculiar to L. planus; it is found in other morbid conditions of the skin, more especially in the chronic circumscript neurodermatitis, and in the state to which the name "lichenification" has been given by modern French writers. Probably digestion experiments might disclose changes in the early stage of the young lichen papule which are too slight for the microscope to detect.

The cellular infiltration takes place first round the walls of the blood-

vessels, which are dilated, though often very slightly; and it is accompanied by oedema, and widening of the lymph spaces. The number of cells increases until the whole of the papillae and papillary body—the whole area between the epidermis and the plane of the superficial layer of blood-vessels—is choked with them. The cells composing the infiltration vary according to the stage or type of the lesion. A large proportion of them consist of mononuclear cells, some large with vesicular nuclei, and suggesting an origin from endothelial cells, others about the size of lymphocytes with large nuclei and little protoplasm. The latter type Unna regards as originating from the proliferation of the stationary connective-tissue cells, and not as leucocytes, since there are but few leucocytes in the dilated lymph-spaces. A few polymorphonuclear leucocytes may be present. In the older lesions definite plasma-cells occur, a varying number of oval or spindle-shaped connective-tissue cells, and occasionally giant cells. The infiltration is formative in character, and in the older lesions shews signs of organisation. The infiltration spreads horizontally, and has little tendency at first to pass downwards; though in the more advanced stages it may pass downward in the immediate neighbourhood of the vessels towards the hypoderm.

While these changes are taking place in the corium the epidermis has begun to undergo very evident changes. The lymph spaces in its lower layers are dilated, and a large number of wandering cells pass in. The palisade cells are compressed horizontally, and are distorted by the pressure from below and the tension of the horny layer above. The prickle layer becomes hypertrophied (acanthosis), and the granular layer and also the horny layer in its lower strata are increased and thickened (hyperkeratosis). This increase of the upper epithelium persists, and the horny layer being of a peculiarly firm character, the softer prickle layer is crushed between the tense and swollen papillae below and the hard and granular and horny layers above, until it is reduced to a mere plate; with its disappearance a corresponding depression of the surface is brought about. But where there is a space left between the swollen papillae the epidermis takes the line of least resistance, and, growing down between them, produces, as it cornifies, the irregular horny plugs and wedges which can be picked out from the surface of the papules.

In like manner the abnormal cornification process affects the epithelial lining of the sweat pore, which proliferates right down to the papillary body, and cornifies with the same characteristic hardness as the surface epithelium. The condensed white plugs of keratosed epidermic cells, which are thus formed in the upper portion of the pore, have been spoken of as "horny pearls"; and the falling out of these plugs is supposed by Crocker and Robinson to account for the minute pit so often found in the centre of the smooth surface of the papule. Török thinks that although the falling out of the plugs does undoubtedly leave a corresponding hole, the little central pit is really caused by the holding down of the epidermis by the sweat duct, so that the papillae are unable to swell and lift that portion of the epidermis up to the general

level. Several of my own sections seem to support this view, for the pit, as there seen, is not merely a dilated tube, but a crateriform hollow lined with epithelial cells which are flattened out, as if stretched from the lowest point where the pore opens.

Not merely the sweat pore but also the duct and even the gland itself are often involved in the disease. The epithelial cells of both degenerate, the lumen is dilated, and is often filled with a granular or glassy mass (Unna). The connective-tissue cells around undergo proliferation, which is all the more remarkable since the rest of the cutis is unaffected, and the hair follicles in their deeper portions are very rarely implicated.

At this stage, then, we have two counteracting processes at work. Below there is the papillary body enlarged by the dilatation of its vessels and the intense infiltration of cells, and tightly swollen by the oedematous effusion; the overlying epidermis, which at first gives way and is stretched, passively, as it would seem, over the engorged papillary base, also soon begins to react; its layers become hypertrophied, and the cornification of the upper cells becomes so firm that it is enabled to resist any further pressure from the uprising papillae below. This peculiar stretching and the dense and firm character of the horny layer cause the remarkable waxy gloss of the papules. In some forms in which the cornification is not sufficiently dense to prevent desquamation this burnished look is not produced, and it is always lost in the more chronic and extensive lesions.

In the early stage, when the dilatation of the vessels is the most prominent symptom, the papules are red in colour; but as they become covered with infiltration cells the tint becomes more livid, and this again is changed, as the whitish epithelial layers thicken over it, to a bluish or even distinctly lilac hue. The papule may now be likened to a more or less lens-shaped cushion of swollen papillae, covered with a layer of thickened epithelium tapering off at the sides. The pressure tends to abate the vascular activity in the centre, but it continues actively all round the edge where the redness is still visible, so that the papule appears of a bluish-red in the centre and of a brighter red at the periphery. As both the horny and granular layers push downwards, wherever they can, around and between the groups of agglomerated papillae, the epithelial covering is thicker in these places than elsewhere; and the white granular layer, being more freely developed in these downward prolongations than elsewhere, gives rise to the peculiar milky-looking network so distinctive of the disease.

From this time degenerative changes begin to appear. The hyperplasia of the prickle cells ceases, and the cells, separated by the oedema, lose their distinctive characters and are converted into colloid clumps. The cellular infiltration of the papillae diminishes by degrees, and long, spindle-shaped, partially pigmented cells appear round the vessels. The lymph spaces are dilated to such an extent that the epidermis is loosened from the corium (Caspary). The colloid degeneration now attacks the

papillary body, and the vessels become swollen, hyaline, and impervious. The thickened, hard, horny layer, no longer having a firm base beneath, drops down, and the centre of the papule tends to become hollow. The collagenous tissue of the uppermost stratum of the cutis may now undergo a distinct fibrotic change, and, if the sclerotic shrivelling be well marked, the further progress of the lesion is prevented. The epithelium becomes atrophic, the hyperkeratosis disappears, pigment is deposited, and the affected area is depressed and scar-like.

*The elementary eruptions* are formed by the combination of these various processes in varying extent and degree. Thus the polygonal papule is characterised in its early stages by the great preponderance of the papillary changes over the epithelial, and their restriction to a small group of papillae surrounded by the normal minute furrows of the skin. In the plane papule the reverse is the case; the epithelial changes markedly preponderate, and the papules spread at the edge. In the obtuse papule, which grows in a circular form round a sweat pore, the changes of epithelium are more equally balanced, and the whole of the sweat duct is involved in the inflammatory process. The follicular papule grows in the same way round the mouth of a lanugo hair follicle, and—like the obtuse papule—leads to the formation of a central horny plug.

*Hypertrophic Forms.*—In the older and larger papules the original relation of the epidermis to the cutis is altered. The epithelium, which at first was pushed upwards and stretched, begins to proliferate and to push downward, wherever it can, between the papillae. The prickle layer is again increased, although its cells are still flattened by the pressure; and the granular and horny layers are markedly thickened, producing a number of downward prolongations of very various size. In the centre of the papule this downward growth flattens the papillae, and pushes them down below their usual level, so that the cutis looks almost crateriform; whilst at the periphery they are still swollen and prominent. In L. verrucosus the process goes to a still greater length: the papillae, though flattened, are infiltrated, the prickle and granular layers are thickened, and the horny layer is converted into a dense, non-desquamating plate. In the underlying corium a sharply defined tumour-like mass of round and spindle cells is formed.

*Atrophic Forms.*—In contrast to these hypertrophic varieties of lichen are those in which the process is so slightly developed and transitory that an early reabsorption takes the place of the central horny thickening, and the patches, instead of being discoid, are annular; the edges only being raised, and shewing the typical appearance of the disease. Unna, who has examined this variety very carefully, found that there are the usual progressive changes slightly but characteristically developed in the narrow margin, but that the regressive changes are entirely absent. In the annular type of lesion, however, this central retrogression is rare, the usual mode of formation of the ring being by the aggregation of ordinary papules in a circinate fashion. There is another atrophic form—described by Hallopeau as L. planus atrophicus or sclerosus—in which, in

addition to the ordinary changes, the acanthosis and hyperkeratosis penetrated right down into the sweat ducts; and Darier found that the cutis was sclerosed through its entire thickness, which so interfered with the epithelial growth as to prevent the formation of anything further than horny pearls and pigmentation.

*Mucous Membrane.*—In the case of the mucosa the histo-pathological changes have been studied by Dubreuilh who noted in the L. planus lesions of the tongue, changes similar in the main to those which occur in skin lesions; namely, a cellular infiltration like that in the skin, occupying the papillary and sub-papillary layers, and densest near the lower ends of the interpapillary processes, slight dilatation of the blood-vessels, and proliferation of the epidermis with elongation of the inter-papillary processes, which is responsible for the fine white network, the meshes of which are occupied by the filiform papillae. The stratum corneum was not thickened, but appeared to be diminished. A granular layer with keratohyaline granules has been described in the mucous membrane lesions by v. Poor, but Dubreuilh only succeeded in finding a few granules in one case.

**Signs and Symptoms.**—The elementary lesions, although they all have the same fundamental microscopical characters, present various modifications according as the alterations of the cutis or that of the epidermis are more or less highly developed; or as the sweat ducts or hair follicles are more or less implicated. By the different methods of evolution, again, very different phases of these elementary lesions are produced (annular, discoid, atrophic, verrucose); yet in the end all tend to reabsorption, with a more or less complete restitution of the normal epithelium. In pronounced lesions there is always some slight permanent atrophy after their disappearance, and there is always a tendency to an enduring pigmentation (*vide* Fig. 125).

At first the colour of the eruption is red, though some papules may be pale; but as the epidermis thickens it casts a white shade over the underlying hyperaemic redness, giving rise to a bluish or lilac hue. The burnished surface of the papules, which brightly reflects the light, with this lilac tinge, the red areola, and admixture of brown pigmentation, together form a most striking and characteristic picture. A little punctate depression is found in many papules, but not in all; it is in no way characteristic of the disease. A much more significant sign is the presence in the papules of a white, milky-looking network which shews through the horny layer when tightly stretched. As the papules agglomerate to form patches their individuality is lost, and they become covered with scales; but the edges of the patch still shew sufficient of this network to allow of a differential diagnosis. The pigmentation which accompanies the departing lesions may be of any shade of brown, occasionally deepening into black; it is usually darker than that left by any other lesion of the skin, even by the syphilides.

Almost every part of the integument may be attacked, indeed almost the whole surface may be involved at the same time (L. universalis).

The commonest positions are the flexor surfaces of the wrists and forearms, the shins, and the inner surfaces of the thigh; then come the trunk (particularly the portions pressed upon by the corsets), the neck, the outside of the thigh, the hands and feet, and especially the palms and soles; the face and scalp are rarely affected; the nails hardly ever. The symmetry, in the early stages at any rate, is generally well marked; though lichen, like psoriasis, may be unilateral. But odd patches or streaks may form, and remain without any attempt to spread symmetrically.

In one case of mine, in a woman, the lesions, which were well marked, were confined to the flush patch of the face; after almost complete removal, the patient returned five years later with the lesions on the face in their former condition, and a fresh patch on each wrist. Several cases have been recorded in which the eruption was confined to the area of distribution of a single nerve. The mucous membranes are by no means infrequently attacked, more especially that of the mouth, where the lesions appear in the form of white dots, of patches and streaks, or of a white milky network. They are most frequent opposite to the junction of the upper and lower teeth, but may cover the whole of the cheeks, palate, and fauces. On the tongue they closely resemble leucoplakia; and the red of the lips, when they are affected, looks as if tattooed with some white substance. The extent of the changes in the mouth bears no proportion to the general intensity of the disease on the skin, nor to its period of development; for it may precede all cutaneous symptoms (Crocker, Audry), or follow when the lesions on the body have already disappeared; or again it may constitute the only symptom of the disease (Frèche). Inside the labia the patches are milky white; but on the glans penis the colour depends on the extent to which it is covered by the prepuce, and on the degree of cornification of the epithelium. In my experience the mucous membranes of the genitals are not often attacked.

The attacks may be either acute or chronic, the latter being the more common; but in either form the course and development depend largely on the character of the papular elements.

Unna has divided the various lichen papules into four varieties, of which three were included in Wilson's original description of lichen planus: they are—(i) The *polygonal papule*, which derives its shape from the pre-existing skin furrows which form its boundaries; it is miliary to pepper-corn sized, and usually widely distributed, especially on the wrists, backs of the hands, forearms, legs, abdomen, neck, and genitals. (ii) The *obtuse papule* is larger (5-7 mm.), smooth, shining, free from scales, having a wax-like translucence, and shewing a small depression or white horny plug corresponding to the mouth of a sweat gland in its centre. As these papules grow they tend to become flattened, and to leave behind deep brown, somewhat sunken spots. It is almost the only form which is found in infants and young children. (iii) The flat or really *plane papule* is not nearly so common as the polygonal or obtuse; it is hardly

raised above the level of the skin, and its centre, which may be even slightly depressed, is hard and burnished. Its colour is bluish or brownish red, variegated with white mother-of-pearl points which shine through the horny epidermis, and may be dug out like milium. These papules occur on any part of the body, even the scalp, and on the palms and soles; though they are more usually found on the lower leg, where they tend to form large patches, which either disappear, leaving much pigmentation, or become chronic and corneous. (iv) The *follicular or acuminate papule*, which is formed about the hair follicles (Fig. 87). It is the small papule of Hebra's original L. ruber, and will be referred to later.

Fig. 87.—Lichen planus—the acuminate phase. (T. Colcott Fox.)

All these different varieties may occur separately or in conjunction. The first three, the "planus" papules, are those usually met with, the acuminate kind being rare. To the type of case in which acuminate follicular papules occur in association with polygonal or plane lesions, Dr. J. J. Pringle has applied the designation Lichen plano-pilaris (Fig. 88).

In the chronic and more common form of attack the papules appear either discretely or (in the polygonal form even from the first) in patches. In any case they tend, sooner or later, to agglomerate and form patches of very varying size, from that of a pea to that of the hand; on certain areas, such as the abdomen, a large surface may be completely covered. They then lose the red colour in the centre and become lilac, or even whitish, if the epidermis grow very thick and dense. The smaller papules may keep their waxy gloss, but in the larger the surface gets wrinkled and irregular, and covered with partially detached, thin, hard, horny plates. Or the thickening of the epidermis may be exaggerated, and the red colour disappear as the patch is converted into a raised, lumpy, intensely hard, dirty grey or brownish horny mass, the surface of which is rough and

stands up abruptly from the surrounding normal skin—L. verrucosus (Fig. 89). These patches may persist for indefinitely long periods; in rare cases they ulcerate (Pringle).

Another and less frequent variation in the patches is where they are in the form of ringed or serpiginous lesions varying in diameter from $\frac{1}{4}$ to $\frac{3}{4}$ of an inch (L. p. annularis or serpiginosus). This is usually the result of

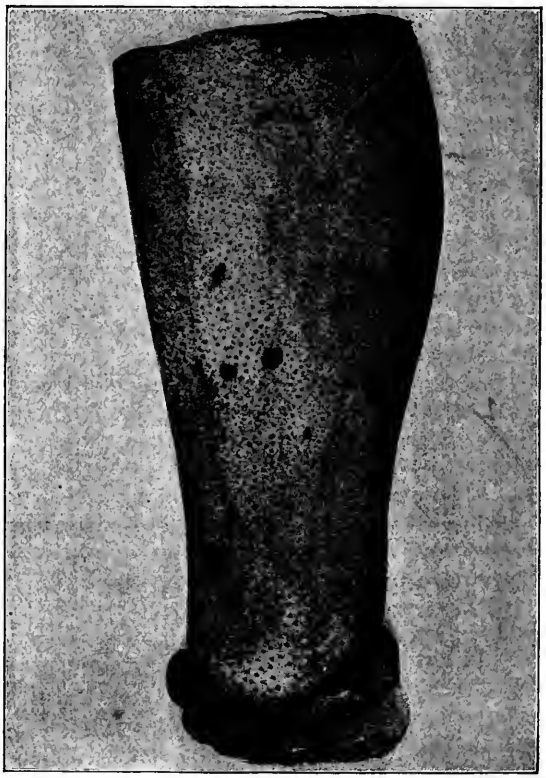

FIG. 88.—Lichen planus characterised almost exclusively by miliary follicular papules with spiny plugs. A few burnished plane papules are seen. The mouth was affected. (T. Colcott Fox.)

the agglomeration of a group of papules in the form of a ring, or of gyri when the ring is incomplete. Occasionally I have seen the papules replaced by rough follicular plugs, looking like a staked-out boundary between the contiguous brown patches. It may also be due to a group of papules, the central members of which have faded leaving pigmentation, while those at the periphery have remained (Hebra's "brooch set round with pearls"). In rare instances the annular lesion is developed from a single papule which has spread peripherally and become absorbed in the centre. Some observers, however, deny this last mode of development.

A bullous-like eruption has supervened in a few cases. Morrant

Baker, Unna, Kaposi, Leredde, and Neuberger have described cases of this kind, and I have met with one, in a patient who was suffering from a by no means extensive attaek of L. planus. The eruption started suddenly, and, though it began chiefly about the neighbourhood of the patches, was not confined to them, but appeared on other parts also. In Unna's cases it was restricted to the lichen patches, and disappeared again under the local treatment, shewing that it was not due to an

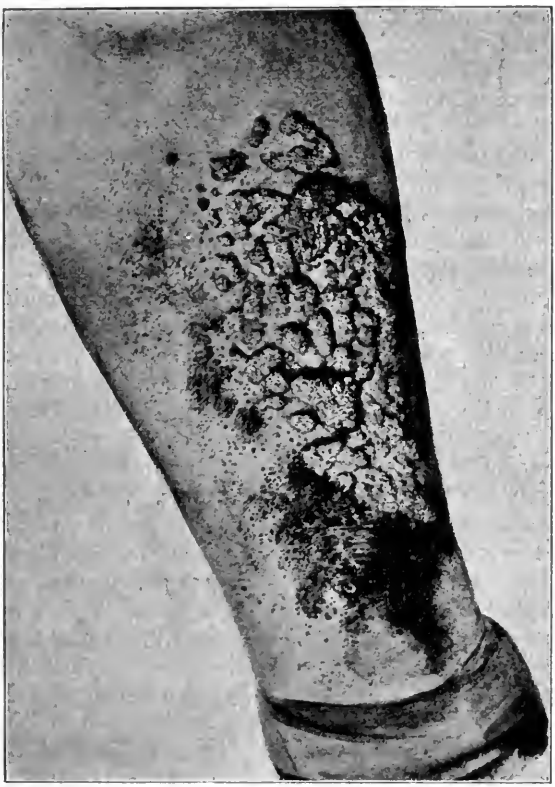

FIG. 89.—Lichen planus. The verrucose or hypertrophic phase which usually originates in miliary follicular papules. (T. Colcott Fox.)

irritative action of the drugs employed. He attributes it to some idiosynerasy of the skin of the individual patients, for were it part of the lichen process it is improbable that it would be so extremely rare. In a certain number of the cases in which bullae appeared, the patient had been taking arsenic, and it has been suggested that this drug was the cause of the bullous formation. There is no definite evidence in support of this view, however, and the arsenic, though it might be regarded as a predisposing factor is not generally considered to be the cause.

The acute attack may begin when chronic lesions are already present, but more frequently it is primary. It often spreads with great rapidity at first, but after a sudden start the later progress may be more gradual. The eruption consists of a closely packed mass of small, red, shining papules, which sometimes remain distinct throughout, but generally run together to form large patches. Later these patches usually scale, and then often present a close resemblance to similar patches of chronic eczema or psoriasis,—with the latter more especially when the scales are white and more lamellar in character. Usually they are small and scanty in amount. The scaling, however, is not confined to the conglomerate patches, but is occasionally found on the smaller and discrete lesions.

In this connexion the following affection described by Unna must be considered.

*Lichen neuroticus* is, according to Unna, the acute general form of lichen, characterised by the presence of acuminate follicular papules and of well-marked constitutional symptoms. It begins with acute general symptoms,—headache, nervousness, hebetude, shivering, aching, and signs of fever. The first signs on the skin are patches of erythema, of about the size of the palm, which appear rather on the extremities or on the thorax. These patches, which have a shagreened aspect, spread quickly until they cover large surfaces of the body, but rarely reach the head or face. Upon the erythematous area, and in its immediate neighbourhood, arise small papules produced by the spasm of the arrectors. They follow an outbreak of nervous excitement, and in the first stages both these and the erythematous patches may disappear when the excitement has passed away, or been calmed by sedatives. Next, often after a few days, comes a formation of more permanent papules, which at first are confined to the hair follicles, but later occur independently of them. They are deep red, raised, conical, shining papules, penetrated by a hair, and may or may not be covered with a small, thin, fine scale. Like "planus papules" they remain in this condition until their resolution, and never become pustular or vesicular. As they increase in number they run together, the skin about becomes swollen and inflamed, and the several patches are lost in areas of a reddish and bluish grey colour, indistinguishable, in the later stages, from those found in universal lichen planus.

In the slighter cases the manifestations may recede before these patches form, and the patient then passes into a severe general lichen after the ordinary type, with the formation of planus patches and pigmentation. In the more severe cases, however, fresh attacks of fever, unrest, and intense itching occur, fresh crops of papules are formed, the skin generally is deeply pigmented, and the colour of the patches themselves may become almost black. The amount of desquamation is variable; it may be considerable, and removed freely by the finger nail when scratching (Unna), or it may be very slight (von During). In the most severe cases the attacks of itching are incessant; the nervous irritation, sleeplessness, feverishness, and loss of appetite all combine to

bring on emaciation, and the weakness of the patient, his hollow eyes, and sunken cheeks all point to a serious illness. The formation of the patches and the infiltration are so well marked that the skin consolidates into plates which it is hardly possible to raise into a fold; the pigmentation becomes a very dark, almost black sepia-brown, and the scales are small, thin, and shining. On the head and face papules rarely arise, but there are often red scaly streaks on the face, and the scalp is red and scurfy. Sometimes the hair falls, though the nails are never affected. In this form the condition may last for months, to end, as in Hebra's first cases, in marasmus and death, or in complete recovery.

It is thus obvious that L. neuroticus, which corresponds so closely to Hebra's original L. ruber, is a primary disease, not a mere L. planus. It begins, not with discrete papular lesions, but with an acute erythrodermia, on which the small acuminate papules arise, and which leaves behind it a mass of dark pigment cells in the corium. Even in universal L. planus this acute erythrodermia is never found.

The possibility of a confusion between these conical papules and those of pityriasis rubra pilaris, when the existence of the latter disease was, in Vienna at any rate, unknown, is easily seen; hence the transition of the L. ruber of Hebra into the L. ruber acuminatus of Kaposi. But, as von During points out, Hebra and Wilson must have seen some points common to their lichen ruber and lichen planus, or they could not have agreed to regard them as forms of one disease. Probably they were impressed by the formation of plates common to both, for Hebra in his original account of the disease described such plates, as Wilson did for lichen planus. The acuminate form of the papule is the expression of the acuteness of the disease, and such papules may be found now and again in universal L. planus, and possibly had been noted by Wilson.

The prolonged uncertainty among dermatologists as to the identity of Hebra's L. ruber may be due in part to his having included other conditions in his description, but in part also to the fact that the acuminate form of lichen with severe nervous symptoms is a rare form of disease which, if it does occur, is unfamiliar to British dermatologists at the present time. In discussing L. neuroticus, Croker stated that he was unable to recognise it from Unna's description. Yet after the careful descriptions of Unna and von During it seems possible that L. neuroticus may represent actually the original L. ruber of Hebra, and that the latter is really a member of the same group as the L. planus of Wilson.

Although the acute general forms of the disease, if treated at once, may sometimes be removed very quickly (in one of my cases in three weeks), it is usual for some of the lesions, and most frequently those on the legs, to persist and take on a chronic form. When these remnants have been removed, the patient, in a great majority of cases, remains free from other outbreaks. Others are not so fortunate, and, before the first attack has disappeared, a fresh relapse occurs, either round the old patches or in entirely fresh areas; thus the course of the disease is

protracted for long periods. More rarely the recurrences take place after the complete disappearance of former attacks; and in very exceptional instances they take place with some degree of regularity, as in the case recorded by Crocker, in which the patient, a lady, had suffered from the disease for fifteen years, and for five years had had a fresh attack every July.

The *general symptoms* vary most remarkably in different patients. They are not usually well marked, even in acute cases; and they seem to depend largely on the amount of itching present, and on the loss of rest and consequent depression which this entails. The itching is generally well marked and troublesome, but occasionally it is only slight, and may be entirely absent; sometimes it is replaced by pricking and burning. I have met with two extensive acute cases in which the patients were able, with the help of the usual antipruritic treatment, to pursue their avocations and to make quick recoveries. On the other hand, the pruritus may drive the patient to frenzy, and leave him no rest night or day. In two extreme instances which I have seen, in the effort to procure relief the patches had been actually gouged out of the flesh by the finger nails. In acute cases the irritation generally ceases when resolution sets in, but in old chronic patches is apt to continue indefinitely; finally it may disappear, though the patch may seem unaltered. The horny hypertrophic lesions, especially on the lower leg, cause far more trouble in this respect than the large, flat, rather atrophic patches. Eruptions in the mouth evidently give rise to little alteration of sensation, for in the early stage the patients are generally unaware of their existence; but, if extensive, the contact with hot food or drink, or with condiments or tobacco smoke, is painful. No internal symptoms are definitely known to be connected with L. planus, but Pospelow suggests that the diarrhoea, which Crocker, he himself, and others have noticed in patients suffering from the disease, may possibly be due to an eruption of papules in the alimentary canal, since he has noticed that it disappeared, step by step with the skin trouble, under the influence of arsenic.

**Variations.**—An unusual and rare form of lichen planus has been described by Crocker under the heading of *Lichen planus erythematosus*. In it the initial papules are bright crimson in colour and exceptionally vascular and soft. Of this variety only a few cases have been reported. Crocker's patient was a healthy man of 62, and the eruption which began in the groins consisted of crimson-red papules very like that of lichen planus, nearly confluent in large patches, not scaly, not distinctly raised, and almost completely disappearing on pressure. On the trunk the papules were fainter, but very general and diffuse in the axillae, and abundant on the lower part of the abdomen. It was associated with much itching when the patient undressed. It disappeared under treatment, leaving slight pitting where the papules had been.

Another rare variety of lichen planus is that known as *Lichen planus striatus*, in which the eruption is arranged in the form of a long band, sometimes extending down an entire limb. In several instances such a

band has been observed extending downwards and backwards from the inguinal fold to the calf, apparently following the course of the small sciatic nerve. In other cases it appeared to follow other nerve lines, such as the left ulnar and internal cutaneous nerves of the upper extremity (Stephen Mackenzie), the inferior gluteal and popliteal nerves (Balzer and Mercier), and the terminal distribution of the long saphenous nerve (Perry). In other cases the distribution did not seem to correspond to that of any nerve, Voigt's lines, or to segmental areas, and suggested a relation with the distribution of blood-vessels or lymphatics. Many of these cases bear a striking resemblance in their distribution to the linear forms of ichthyosis hystrix (*vide* Fig. 2, p. 25), but differ in not being congenital in origin, in disappearing either spontaneously or under treatment, and in being associated with more or less itching, and not infrequently with the presence of typical L. planus lesions elsewhere.

One very remarkable form of the disease has been described by Kaposi under the name of *Lichen moniliformis*. It was a very chronic affection, having lasted fifteen years; and the lesions consisted of large stringy scars, like those of a burn, or of cheloid, which were covered with planus papules. The scars were coralline in colour, and situated chiefly on the neck and flexures, though some were present on the trunk. They ran in the long axis of the limb, but on the body and neck they were crossed in various directions. Histologically they presented the appearance, not of cheloid, but of chronic inflammatory new growth. Róna met with a similar case, as did also Dubreuilh; and von During observed one in which the strings of papules appeared on the marks produced by scratching. The nature of the cheloid-like growths is uncertain, and needs further investigation.

**Diagnosis.**—In the great majority of cases there can be no difficulty in distinguishing lichen planus from other diseases; for the small, red, or bluish papules, with the flat, smooth, shining tops and underlying white points or reticulations, together with their tendency to agglomerate into patches, are sufficiently characteristic. Furthermore, in the scaling stage the patches are associated with the peculiar dark brown staining which denotes the period of retrogression, or marks the site of former lesions. The hypertrophic verrucose variety is distinguished by its horny hardness and the minute honeycombed, thimble-like appearance of its surface. Chronic patches might be confused with psoriasis, chronic eczema, and lupus erythematosus. But in *psoriasis* even the smallest lesions are covered with scales, and in the larger chronic patches the scales are not so horny and adherent; moreover, when they are removed the underlying surface bleeds readily from the papillary vessels. In *eczema* there are always some signs of previous punctate oozing to be found, and generally some distinctive papules in the neighbourhood. In *lupus erythematosus* there is the atrophic centre with its red border as a guide; and the epithelial plugs, though they may closely resemble those of L. planus, always lie in the mouths of the follicles, and are not embedded in a horny epidermis.

The acute generalised cases of lichen planus may somewhat resemble

*pityriasis rubra pilaris*, but this resemblance is superficial. The initial lesions of the two affections are different; in pityriasis rubra pilaris they consist of conical or round papules with a horny centre, whereas in lichen planus they are polygonal in outline, usually flat-topped, and rarely acuminate. In pityriasis rubra pilaris typical lesions are present on the backs of the fingers, whilst in L. planus the fingers are almost never affected. In P. r. pilaris the scales are less adherent, and desquamation is an early and characteristic feature, whereas in acute L. planus desquamation is less marked and occurs late, when the eruption is fading.

Dr. Colcott Fox has pointed out, as a difficulty in the diagnosis of lichen planus in children, the well-known fact that most miliary papules on the child's skin, when disappearing, tend to become flat-topped and shining. This is often seen in papular eczema, in small papular syphilides, in milaria, and particularly in lichen urticatus, or papular urticaria. In the last affection the resemblance is often so marked as to render a distinction between individual papules almost impossible. The presence of other more characteristic lesions will usually remove at once any further doubt as to their real nature.

Certain *seborrhoeic papules* take on this form in adults as well as in children, not only in the stage of retrogression, but during their growth. They are firm, red, raised, with flat shining tops; and, when occurring in large numbers closely packed together, may resemble the miliary form of lichen planus. They are not, however, so hard, they have not the bluish tinge, and, if irritated, they may become acutely eczematous.

Incessant scratching on the skins of persons who have a certain predisposition (pruriginous diathesis, Besnier) is apt to produce a form of lesion ("lichenification," Brocq; "lichenisation," Besnier; for description *vide* article "Pruritus," p. 295), on which arise flat papules of a dull red or even bluish-red colour, and a flat shining surface not unlike those of lichen planus. They may also occur in patches of various sizes, from two to ten inches across (*Neurodermatitis chronica circumscripta*, *Lichen simplex chronicus* (Vidal)), in which the papules are packed closely together, so as to intensify the normal furrowing of the skin, and to give the same "cross hatching" effect ("quadrillage," "felderung") which is seen in agglomerations of polygonal lichen papules. The papules are not the cause, but the result of an intense local pruritus, and are formed by a hypertrophy of the papillae and epidermis produced by scratching and rubbing. It is doubtful if this condition should be regarded as a separate disease. Many cases of it are badly marked cases of L. planus, which may commence with a patch of this description, others are chronic eczema.

**Prognosis.**—It is quite impossible to foretell even the probable duration of a particular attack. Part of the eruption, at least, is likely to become chronic; but a good deal depends upon the stage at which the treatment is begun, those cases being usually most quickly controlled in which the treatment is undertaken at the beginning. But the cases of

general eruption are never prolonged indefinitely, like those of psoriasis; and even the most obstinate remnants may exist for years without ever giving rise to a fresh attack, and disappear, either spontaneously or under the influence of treatment, never to return.

**Treatment.**—The only internal remedy which exercises anything like a specific effect is arsenic, and, as in psoriasis, it not infrequently fails. Any beneficial action it may have, however, is only in the chronic cases, for in the acute generalised cases it does more harm than good. Before it is administered any defect which can be found in the patient's general health must be remedied by attention to indigestion, constipation, neurasthenia, nervous excitability, gout, scrofula, and so forth. Special care must be given to the state of the nervous system by ordering rest and change; sedatives, such as bromides and valerian (Brocq), must be administered if there be much irritability; and iron, strychnine, and quinine (hydrobromides), or mineral acids and nux vomica (T. Fox), if the case be atonic. As in all inflammatory diseases of the skin rest is invaluable; and, though not absolutely essential in the milder cases, it materially shortens the duration of the disease. Jacquet's plan of douching the patient for three minutes with water at 95° F., followed by a splash of colder water, has been found very beneficial in irritable cases (Frage, Dubois-Havenith); and he reports a cure in several cases by these means alone when all other remedies had failed. Generally, however, in acute inflammatory cases it is better to assist the external measures by internal medication. I have found tartarated antimony (15 min. of the wine, three times daily) very helpful. Brocq gives quinine, with belladonna and ergot, as in urticaria, a combination which Leistikow also strongly recommends; Radcliffe Crocker administered large doses of quinine in an effervescing mixture. To relieve the irritation antipyrin (10 gr. three times daily) has been found useful (Pringle). In general eruptions, which are not so acute, biniodide of mercury has been recommended (Morris); either in the form of pills, or in the usual solution with iodide of potassium and sarsaparilla. As soon, however, as the very acute stage has passed, and the patient is able to tolerate it, arsenic may be tried, either in solution or in pills. The hypodermic method of Lipp and Köbner is more rapid, and relieves the itching more quickly; two drops of Fowler's solution, freely diluted and sterilised, are injected two or three times daily, the dose being gradually increased. Instead of Fowler's solution, the liquor sodii arsenatis may be substituted, which has the advantage of being less liable to decompose. It is given in doses of 3 drops injected daily, and gradually increased till the limit of toleration is reached. The organic arsenical preparations may also be employed, and appear to give better results in this disease than in psoriasis. Snowman records a number of cases successfully treated by injections of atoxyl, and other observers have had satisfactory results with arsacetin. Atoxyl (sodium arsanilate) is given in doses of $\frac{1}{2}$ to 2 grains, dissolved in warm water and injected twice a week, the dosage being regulated according to the body weight. The other

members of the arylarsonate group, namely, soamin, arsacetin, and orsudan may be substituted for atoxyl in doses of 2 to 5 grains injected twice a week. Of these preparations arsacetin and orsudan are more stable than soamin, and less liable to disintegrate on being kept. Their relative therapeutic merits further experience will shew; meanwhile it is well to remember that they all contain a large percentage of arsenic, and are liable to cause grave toxic symptoms, a few cases of blindness from double optic atrophy having resulted from their employment (Lane). Some patients, however, cannot tolerate arsenic in any form, and few in this country would tolerate it in the form of frequent injections. On old-standing verrucose patches it has little or no appreciable influence; and in no case should it be long continued without a careful watch being kept for deleterious by-effects (gastro-intestinal trouble, pigmentation, keratosis of the palms and soles, herpes, neuritis). Bulkley has had very good results by giving chlorate of potassium (15 gr.) before meals, and 10 drops of dilute nitric acid after meals, three times daily.

The external treatment is always an important factor, both in relieving the irritation and in promoting the disappearance of the nodules. In the slighter cases it is often sufficient alone. As in eczema and psoriasis, the intensity of the action of the remedies must be regulated by the amount of inflammation. In very acute cases lead lotion, thickened with zinc and starch powder or calamine, with the addition of a few drops of carbolic acid or liq. picis carbonis, has a very sedative effect. Vidal recommends a litre of vinegar in a starch bath; and inunctions, three times daily, with tartaric acid 1 part, glycerin of starch 20 parts. A tar bath, with 15 gr. of sublimate added, has not only an antipruritic but also a curative action. In ordinary cases an ointment or paste containing liq. plumbi subacet. 15 m., liq. picis carb. 15 m., to one ounce works well; and, if the surface be not too extensive, ammoniated mercury (5 to 10 gr.) can be added with advantage. Unna's well-known ointment is composed of ung. zinci 1 oz., acid. carbolic. 20 gr., hydrarg. perchlor. $2\frac{1}{2}$ to 5 to 20 gr.; the smallest quantity of the perchloride being used in extensive cases, the larger doses being reserved for local caustic effects in stubborn patches. It gives excellent results, and Unna himself asserts that, if used early and efficiently, it alone will remove the threatening general symptoms of an acute attack. Herxheimer and Neisser advise the employment of chrysarobin ointments; pyrogallol ointment has also been advised (Morris): and when the eruption is no longer acute they act quickly and satisfactorily. Their action is increased by the addition of salicylic acid, which softens the hard epithelium, a softening which may be effected, as a preliminary measure, by means of salicylic acid plasters; but the macerating action of a plaster containing other remedies (tar, sublimate, carbolic acid) will suffice in all but chronic cases. It answers as well to paint the skin with a strong tar tincture containing salicylic acid and sublimate and to cover with a plaster; yet some of the horny accumula-

tions of lichen verrucosus resist all these measures. The superficial application of a cautery is said, by Broes van Dort, to remove the itching in the hypertrophic lesions, which is sometimes so intense and persistent that some such radical means of treatment may be necessary. The best method of dealing with these lesions is by means of the *x*-rays, which not only relieve the itching but cause retrogression of the patches. A single Sabouraud pastille dose of the rays may be sufficient. If it is not, further doses may be given at intervals of six to eight weeks. The patches may also be removed by radium.

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J. M. H. MACLEOD, 1911.

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# PEMPHIGUS

By T. COLCOTT FOX, M.B., F.R.C.P.

**Introduction.** — The early history of this subject is set forth in Ferdinand Hebra's work on diseases of the skin translated by Hilton Fagge and Pye-Smith. The application of the word "pemphigus"

(πέμφιξ, a blister) was at first vague, but gradually came to be practically synonymous with an eruption of bullae, with or without inflamed bases, contagious or non-contagious, febrile or non-febrile, acute or chronic, with or without marked sensory disorders. This chaos was in some measure cleared up by the recognition that bullae or blebs may be excited by a number of processes. Bullous lesions may be brought about by local inflammation due to external injuries, such as vigorous compression, burns, caustics, and so-called vesicants, for example cantharides. This category now contains the artificially produced vesications long known as *Pemphigus hystericus* or *virginum*. A separate place is also now assigned to the congenital, often hereditary or familial, condition of vulnerability of the skin called *Congenital Traumatic Pemphigus* or *Epidermolysis bullosa*, in which a slight trauma will cause a bulla. This affection has an interesting relation to certain forms of true pemphigus; thus, I have recorded a case in which epidermolysis has supervened on pemphigus. It is now known that the formation of bullae may occur exceptionally as an extreme phenomenon in certain processes, such as erysipelas, erythema multiforme, urticaria, lichen urticatus (Bateman), lichen planus, and hydroa aestivale, which are defined by other characters. Again, bullae may occur as an epiphenomenon in the course of maladies in which the nervous system is implicated, as in chronic myelitis, syringomyelia, peripheral neuritis, and leprosy, and in the latter bullae may probably be due both to neuritis and also to injury of an anaesthetic skin. Another form of production of bullae is due to the ingestion of certain drugs, such as iodide of potassium, copaiba, phenazone, and quinine. A bullous syphilide, particularly on the hands and feet in congenital syphilis at birth or shortly after, is known. The fact that infection of the skin by certain micro-organisms can produce vesications is very important in relation to true pemphigus. Thus streptococci are the cause of the eruptions known as impetigo contagiosa, the so-called pemphigus neonatorum occurring in epidemics or sporadically, and perhaps of the pemphigus contagiosus of hot climates. Possibly this coccus is the secondary cause of bullae appearing in the course of chicken-pox, small-pox, and other specific fevers, and in scabies. The *Bacillus pyocyaneus* also appears to be able to cause bullae. It need hardly be mentioned that the vesicles of eczema and dysidrosis under the thick cuticle of the palms and soles may become confluent and simulate true bullae. Lastly, it may be added that in 1890 Hallopeau called attention to some special *Recurrent Phlyctenular Eruptions of the Extremities.*

After the elimination of these eruptions, the next important step taken was to separate from the old pemphigus group the eruptions conveniently called *Pemphigoids* of Besnier, and described under the names *Hydroa* (Tilbury Fox), *Dermatitis herpetiformis* (Duhring), and *Dermatite polymorphe douloureuse* (Brocq). In this clinical group bullae may be entirely absent, or present, or predominate, in certain stages, so that the condition may be difficult to diagnose from pemphigus. The majority

of observers regard the separation as at least a clinical convenience, although Kaposi strongly opposed it.

There still remain the bullous eruptions, now called pemphigus. A first group is composed of more or less grave febrile cases, denominated *Acute Pemphigus.* Some cases have been associated with wounds in such people as butchers, tanners, and agriculturists, handling animal products, and others have followed vaccination with calf lymph. The second group is that known at the present time as *true pemphigus.* Two further forms have been specially described, namely, *Pemphigus vegetans* and *Pemphigus foliaceus*, as distinct diseases, but there is much to be said in favour of the view that they are merely phases of true pemphigus, and even pemphigoids. When in course of time the causes of these eruptions are discovered we shall be on surer ground than at present.

Acute Febrile Grave Pemphigus.—Syn.: *Acute infectious bullous Dermatitis.*—**Introduction.**—Formerly the Vienna school did not accept the occurrence of an acute pemphigus, but numerous cases have been recorded under this title characterised by a bullous eruption, or the association of bullae with vesicles or erythema, running a rapid course for some days or weeks with or without fever, and often terminating fatally. Some of these appeared to be contagious. A study of the literature shews that these records deal with different affections, such as the contagious streptococcic bullous eruptions, including the so-called pemphigus neonatorum; bullous forms of erythema multiforme, often grave; bullous eruptions arising from the ingestion of medicaments, such as potassium iodide, phenazone, quinine, and copaiba; the rare bullous urticaria; bullous varicella; some cases with multiform eruptions suggesting an outburst of dermatitis herpetiformis of more or less gravity; and the bullous eruptions, described as acute pemphigus, complicating measles and scarlet fever. But after the exclusion of these forms we are left with a number of records of acute bullous eruptions of brusque onset, with marked febrile disturbance, and often causing death, which may well be grouped together for further study under the name given at the head of this section. A case recorded by Dr. G. Pernet in 1895-96 in a butcher, following a wound on the finger, called special attention to the existence of an acute febrile form of bullous eruption with rapid course and high mortality, apparently caused by the infection of a wound, and occurring usually, if not invariably, in butchers or persons who have to do with animal products. Dr. Pernet collected five very similar recorded cases with a history of a wounded finger in three, and found another group in which the occupation of the patients brought them into contact with animals or animal products, and in some of these also there was a history of an antecedent wound. Later, other cases were reported in butchers (Hallopeau and Lévy, Saundby, Bowen, Morley and Ransome, Hadley and Bulloch). It is interesting to note that in connexion with his case Bowen referred to a series of 10 cases of acute grave bullous dermatitis, described by Howe occurring in Boston during an epidemic

of small-pox and increased vaccination. All but one of the cases had been recently vaccinated. Howe states that the average duration was six weeks from the outburst of the eruption until death or recovery took place. "The longest duration of the disease in any one case was sixteen weeks, followed by recovery, and the shortest was one week, followed by death. In these cases the skin lesions began to appear, on an average, five weeks after vaccination, sixteen weeks having elapsed in one case, the longest, and three weeks in one case, the shortest time between the time of vaccination and the first cutaneous disturbance. In the 10 cases which followed vaccination there were six deaths, a most extraordinary mortality. In all the cases the parts most often affected were the back of the neck, the region between the shoulders, the axillae, the buttocks, and the inner aspect of the thighs, and in these places there was a noticeable grouping of bullae. The odour in all the cases was intensely disagreeable, but subjective symptoms were practically absent, though the extensive excoriated areas rendered all movements painful. The lesions in the mouth and pharynx made deglutition painful and often impossible, and corresponding lesions in the trachea produced an aggravating cough." Howe raises the questions, Was it the result of vaccination? and if so, how was it brought about? Bowen says that these cases occurred just before an outbreak of foot-and-mouth disease, and that they were vaccinated with animal lymph. He refers to the occurrence of foot-and-mouth disease in man as the result of taking the milk and its products of infected cattle, and points out the similarity of some recorded cases to acute febrile pemphigus. Bowen also described another group of cases of a comparatively benign nature which followed, but were not proved to be due to, vaccination. He classed these cases provisionally with dermatitis herpetiformis, but multiformity was almost wholly lacking, and the eruption was composed of vesicles and bullae; subjective sensations were slight or absent; and the sites of predilection were about the nose, mouth and eyes, backs of the hands and wrists, backs of the ankles and feet, and the genital regions. Other cases following vaccination have been recorded by Dyer, Pusey, Sequeira and Galloway, Allen, and Towle.

**Etiology and Pathogeny.**—The 8 cases in butchers collected by Dr. Pernet were young adults from seventeen to thirty-three years of age. Dr. Saundby's butcher's boy was aged fourteen years, but the case was comparatively mild, and recovery followed. In Howe's post-vaccinal cases the ages in 9 cases ranged from thirty-three to forty-seven, and one was twenty-one years. The frequency of local wounds preceding the eruption is notable. In Dr. Caie's case of a farm labourer, aged twenty-one years, there was an antecedent wound of the arm and pricked fingers. In Prissmann's case of a girl, aged seventeen years, the eruption followed the extraction of a tooth. The symptoms point to some infection or intoxication, perhaps of different kinds, which future investigation must disclose. The bacteriology is not yet established on a sound footing. In Dr. Pernet's case Dr. Bulloch cultivated from a bulla a special diplococcus,

similar to that isolated by Demme, Bleibtren, and by Dr. Russell Wells in Dr. T. T. Whipham's case, which proved fatal to a guinea-pig. In 1899 Dr. Bulloch again found it in a bulla in a butcher, but inoculations into guinea-pigs failed, and also in Shillitoe's case with later on streptococci and staphylococci. Bowen found a few diplococci in a bulla, and in the nose the *Staphylococcus aureus* and streptococci. Dr. Neild isolated a diplococcus in a child under Dr. Bertram Rogers, as did Sack and also Wellmann from both the blood and bullae.

**Morbid Anatomy.**—In Dr. Pernet's case Dr. Bulloch found the bulla situated between the stratum granulosum and the rete. The contents shewed a distinct fibrinous network entangling rete cells with irregular contour, very granular protoplasm, and badly-staining nuclei. In some bullae the network had broken up, leaving masses of irregular-sized granules, also small round cells with large, deeply-stained nuclei, sparse red cells, and diplococci. The cutis displayed flattened and irregularly-shaped papillae, with distended vessels in some, and a marked infiltration with granulation cells which extended to the deeper layers. The whole appearances were those of a chronic inflammatory process. Eosinophilia seems to be inconstant; in a case recorded by Hallopeau and Lévy there was none.

Necropsies have not thrown much light on the real cause; the renal lesions, hypostatic congestion, bronchopneumonia, and other changes are probably secondary.

**Symptomatology.**—The limited group of cases coming under the heading of acute febrile grave pemphigus is sometimes characterised by an onset with prodromes, such as fever and other constitutional disturbances associated with infective and toxic conditions. When prodromes occur the characteristic bullae usually appear in twenty-four to forty-eight hours, and then continue by successive outbursts, accompanied by exacerbations of the general disturbance. In Dr. Pernet's collected cases constitutional disturbance was usually but little marked until the eruption evolved, and then increased in proportion to the eruption. In two cases the temperature rose to 104·7° and 104·9° F. respectively. He noted the occasional occurrence of erythematous patches and of vesicles, probably a stage of bullous formation. Bullae generally arise directly from the skin without any preliminary redness, and are usually well filled with serum which gradually becomes puriform or slightly haemorrhagic. Discrete at first, their numbers and crowding cause confluence and so tracts of eruption, becoming excoriated and weeping, crusted, or sometimes exulcerated. The evolution is rapid, and tends to be generalised. The fetor of the discharges is a very disagreeable symptom. The mucous membranes are usually involved, and this may give rise to dysphagia, coughing, and other troubles. In Lunn's case, in which dyspnoea developed, the necropsy shewed patches with white membrane in the mouth, larynx, and trachea to its bifurcation.

Except for the pain due to the excoriated areas there is not, as a rule, any prominent and paroxysmal disorder of sensation. The urine is apt

to be scanty, and there may be slight albuminuria. The patient rapidly weakens, acquires distaste for food, may suffer from vomiting, dyspnoea, and diarrhoea, and finally passes into coma. In two cases secondary

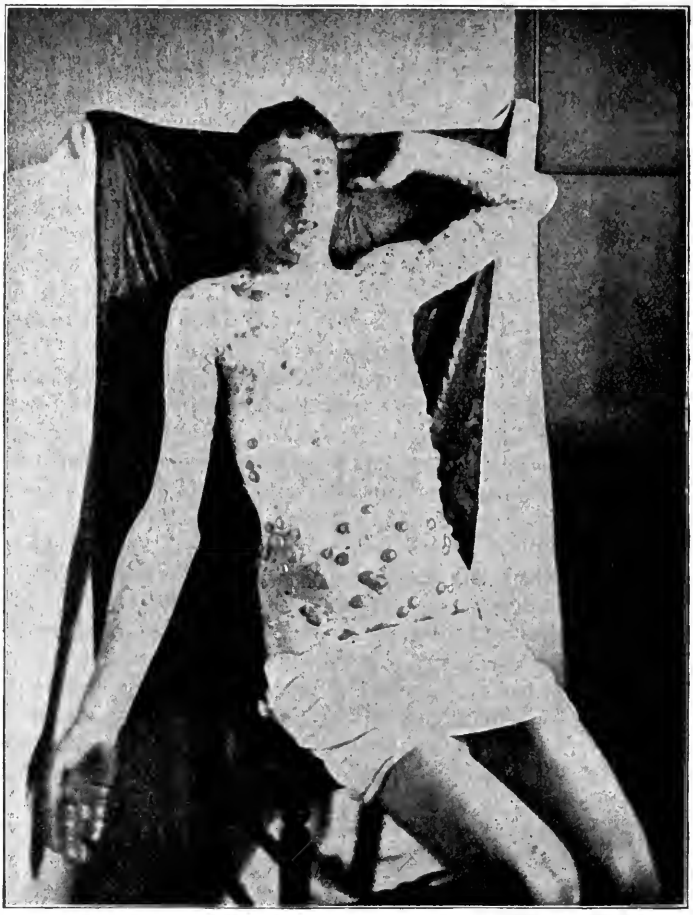

FIG. 90.—Acute pemphigus in a farm labourer, fatal in 13 days. (Caie.)

erythematous rashes appeared. Hallopeau and Lévy noted transient vegetations starting on excoriated places.

**Diagnosis.**—It may be difficult in the early stages to recognise this special bullous eruption, but the rapid evolution, febrile movement, and grave general symptoms will attract attention. After what has been said, the occupation of the patient must be ascertained, and the history of a wound, especially about the hands, sought for.

The **prognosis** is very grave. Of Brocq's 25 collected cases 17 died,

usually between the tenth and the fifteenth day, and further records are in keeping with this experience. One case lasted twenty-four hours. Alcoholics seem to be bad subjects.

**Treatment.**—From the point of view of prophylaxis it is important that those whose occupation brings them into close contact with animals or animal products should pay immediate and minute attention to wounds and pricks. Until the causal agency is known, curative treatment must remain very unsatisfactory, but vaccine treatment should be tried when the infecting micro-organism can be cultivated. For the general symptoms quinine and ergotin in big doses have been employed, and oliguria and cardiac feebleness may call for special measures. Serum injections have been tried. As in all grave bullous eruptions, incessant care is necessary to keep the skin disinfected and sweet by soothing or mild baths, such as the boric acid, and where they cannot be borne the most assiduous attention must be given to other cleansing methods. The mouth and throat, nose, and eyes will require constant care.

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True Pemphigus.—Syn.: *Pemphigus chronicus, Pemphigus vulgaris.*—**Etiology.**—The disease may occur from childhood onwards, but, according to Brocq, it is probably more frequent from forty to fifty years of age. There does not seem to be any special predilection for either sex. The older statistics on these points are complicated by the inclusion of many bullous and vesicular eruptions. Although very little is known as to the cause of the disease, various hypotheses have been suggested. The problem is somewhat complicated by the secondary growth of microbes in the skin and the resulting toxaemia.

The *neuropathic* hypothesis has, in the absence of other obvious causes, been urged on the following grounds: that bullae may appear in certain disorders of the central and peripheral nervous systems; that central and peripheral nerve changes of different kinds have occasionally been found

after death, but it must be remembered that they are exceptional, and may possibly be secondary or mere complications; and that shock or nervous depression has appeared to be a factor in inducing the disease.

A *primary toxaemia* has been considered probable, and Johnston of New York has argued in favour of a toxaemia of a metabolic endogenous origin. He pointed out the frequent presence of a symptom-group of intoxication, evidenced by malaise, anorexia, vomiting, pains in the head, muscles and joints, and a rise of temperature; the prevalence of eosinophilia in the blood and in the contents of the bullae, due probably to the action of a toxin on the bone marrow; the presence of indicanuria; the occurrence of nephritis; the discovery after death of changes common to toxic processes, such as parenchymatous degenerations in the viscera, and occasionally lesions in some part of the nervous system; the frequent occurrence of diarrhoea not due to gross lesions of the intestine; and, lastly, his experience of the good effects of special dietetic and eliminatory methods. Radaeli believes that intoxication accords with the clinical and anatomical conditions.

The conception of a *primary microbic infection* finds some support in certain cases. In the early stages, however, the bullae generally appear to be sterile and organisms are rarely found in the blood. The contents of the bullae may of course rapidly become infected with microbes, especially with staphylococci, which Feletti isolated from the blood and bullae in 1890. The article on "Dermatoses of Streptococcic Origin" (p. 174) contains a description of phlyctenae produced by this organism, especially in infants, and often described as acute pemphigus. It has also been found in the bullae of cases diagnosed as true pemphigus (Babes, Bunch and Pernet, Krzysztallowicz). Luithlen found it in the blood in febrile outbursts in one case; and from the contents of the bullae Bruck obtained a toxin of streptococcic origin which excited a bulla when injected into the skin. The *Bacillus pyocyaneus* is another organism which may be associated with septicaemia and a cutaneous vesico-pustular and bullous eruption, or it may be apparently localised in a vesication, ulcer, or abscess. Petges and Bechelonne in 1908 found it in the bullae, blood, and urine of a case of chronic pemphigus, and after death in the heart. Other organisms have been found, for instance, a special one by P. de Michele in 1891, a diplococcus in the blood and bullae by Dährnhardt, and after death a motile bacillus in the bone marrow in two cases.

**Morbid Anatomy.**—Opinions are not unanimous as to the mechanism of formation of the bullae. The process is probably a special inflammation with predominance of serous exudation, which causes the rapid formation of the bullae, and the clinical absence, as a rule, of a preliminary congested raised area. The rapidly produced abundant serum seems to cleave the skin apart to form a single-chambered bulla situated either in the rete or by separation of the rete from the dermis. In the latter event some tags of the interpapillary processes may remain attached to the dermis, and may give rise to milium-like nodules (*vide* also Fig. 99, p. 463). It is a different process to the progressive infiltration of the rete with the

gradual separation and degeneration of the cells seen in eczema and herpes. Some think that a lack of cohesion in the rete cells, called acantholysis by Auspitz, is fundamental throughout the disease, but it is probably only gradually established in pemphigus as the skin becomes damaged. This state may be due to toxins or some macerating or cytolytic quality in the serum. Eitner and Schramek failed to isolate such, but Bruck found a streptococcic toxin. What influence the vasomotor nerves have is doubtful. Johnston supposes that a toxin paralyses the superficial vaso-constrictors, and that the pressure of the serous effusion is aided by contraction of the arrector muscles. The cutis shews marked dilatation of the blood-vessels and lymphatics, with more or less perivascular infiltration with cells; oedema of the dermis and rete; and impairment or disappearance of elastic fibres connecting the rete with the cutis has been described. The contents of the bullae consist of blood-serum, neutral or faintly alkaline, granular debris, disorganised cells, some pigment cells, and a variable number of leucocytes with a large proportion of eosinophils. Examination after death does not reveal any constant morbid change to explain the cause of the malady. Many patients seem to die from exhaustion, but intercurrent diseases such as pneumonia and tuberculosis may supervene, and nephritis is prone to occur in the course of the disease. Complications may be noted, such as ulceration of the intestines and nerve changes. Radaeli found fatty degeneration of the myocardium in all his cases, and of the liver in four. Lardaceous change in the liver and spleen was noted in one case. Several observers have observed degenerative changes in the peripheral nerves related to the bullae, and even in the great sympathetic. Further, medullary lesions were found by Brocchieri, and sclerosis of Goll's columns by several workers.

**Symptomatology.**—The eruptions, to which the name *Pemphigus* is now specially applied by most authorities, are characterised by the successive evolution of bullae or blebs on the skin and often on the adjacent mucous membranes. The bulla is the exclusive type of the primary lesion, and there is no multiformity of the type and of the special modes of grouping, such as clustering and ring formation, seen in given attacks or recurrences, characteristic of dermatitis herpetiformis. Apart from the pain and burning of excoriated areas, the evolution of the eruption is not, as a rule, specially associated with disordered sensation. The bullae are mostly of rounded or oval contour, in correspondence with vascular territories. They may vary in size from a split pea to an orange. They are fully distended, especially in the earlier stages of the disease, and sometimes throughout its course; but often, as the eruption continues, the skin gets damaged and the bullae are flaccid and ill-formed, and on excoriating weeping surfaces they cannot form. A peculiar deterioration of the skin, which arises in variable degree at different stages of the malady, is known as *acantholysis*. It consists in a diminution of the cohesion between the rete cells, so that comparatively little serous exudation gives rise to a bulla, or the skin slides away under slight

injury (Nikolsky's sign). This condition may occur in some cases of dermatitis herpetiformis, and especially in pemphigus foliaceus, and appears to be congenital in epidermolysis bullosa (*vide* p. 460). The characteristic bulla rises directly from the skin without any marked congestive swelling, but sometimes a red congestive or urticaria-like antecedent stage is noticed. The serous contents are at first clear, but

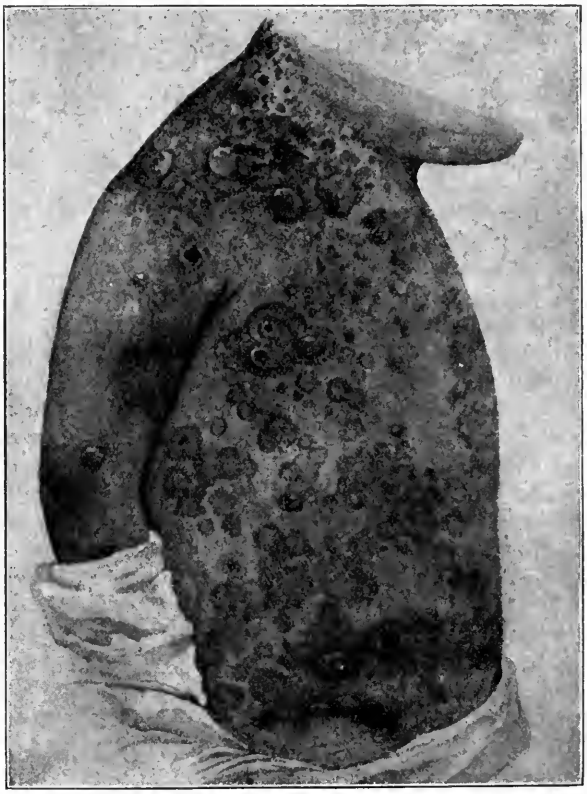

Fig. 91.—Pemphigus.

readily become puriform with the formation of a reactive congestive halo, and exceptionally are stained with blood (pemphigus haemorrhagicus), as in epidermolysis. A pure bulla dries up in a few days or ruptures, while the base heals, leaving perhaps some scaling and pigmentation. Puriform contents cause a crust formation. Other occasional complications will give special objective characters, such as a diphtheroid coating of the excoriations, exulcerations, and rarely a gangrenous process. Papillary hypertrophy may occur, as in other vesicular, pustular, and bullous eruptions, especially about the groins and genitals and axillae. Hyperkeratosis may develop in the palms and soles, apart from the use of

arsenic. As in other bullous eruptions, minute epithelial remnants of the interpapillary processes may be torn off by the bullous formation and leave a number of pinhead-sized, white, and milium-like nodules dotted over the healed skin. Lastly, lymphangitis, adenitis, folliculitis, abscess, and acute bedsore are occasional complications. The number of bullae varies greatly in different cases and stages. They may be scanty or even single, but generally they become more or less numerous, and disseminated with some symmetry over certain regions or the greater part of the surface, or become crowded or more or less confluent. These confluent areas of various size may be reddened and exfoliating, or encrusted, or form oozing excoriations, and such areas may in turn join into large diffuse tracts. As the extent of the damage increases there is a gradual loss of recuperative power in the skin, which remains unhealed, and characteristic bullae cannot be formed.

The mucous membranes, such as the buccal, nasal, pharyngeal, laryngeal, vulvar, and rarely the conjunctival, may be attacked, but in these situations the bullae are usually represented by raw or diphtheroid areas.

The mode of onset varies considerably. It is often insidious and without marked disturbance of the health, and the bullae are perhaps few and localised. Thus the eruption may begin and be confined to a mucous membrane for long periods. In other cases a more widely distributed eruption may be ushered in by fever. There does not appear to be any notable predilection for particular sites.

The course of the disease may be marked by the continuous evolution of bullae (pemphigus diutinus), or by exacerbations alternating with comparative quiescence, or by varied periods of apparent cure followed by renewed outbursts. Thus the course tends to be chronic (pemphigus chronicus of French writers), and the malady may persist for many years. There are, however, malignant cases which run a course of months only, and these approach, and are with difficulty distinguishable from, some cases included in the group of so-called acute pemphigus.

*Constitutional Symptoms.*—In comparatively benign cases, which are specially seen in children, the general health is long preserved. Constitutional symptoms are more or less marked in most cases, and are of two kinds, the one associated with the original process which causes the eruption, and the other brought about by discomfort, sleeplessness, and secondary intoxication. Fever may introduce an outburst of the eruption, or be more or less continuous with exacerbations at the outbursts. The progress of the disease and of the cutaneous lesions is followed by wasting, anaemia, insomnia and prostration, nervous depression or agitation, anorexia, and sometimes by vomiting and diarrhoea. A high degree of eosinophilia is seen in the blood and in the contents of the bullae. The nitrogenous output of the kidneys falls, and nephritis, pneumonia, or tuberculosis may supervene.

**Prognosis.**—French authorities of large experience consider that their chronic pemphigus is one of the gravest of the great dermatoses, and that it is generally fatal. We are all agreed that it is a grave

malady as a whole, but we meet with a certain number of comparatively benign cases, especially in children, which get well, and a few chronic cases may go on for many years. It must, however, be remembered that after an apparent cure the eruption may recur. A scanty or moderate eruption is so far less grave, because it seems to be due to a morbid process of no great intensity, and there is less secondary intoxication from a widely damaged skin. Bad signs are: increasing frequency of recurrences, severe attacks, and the eruption more widespread and continuous leading to a damaged skin without recuperative power, toxaemia, the drain of the exudation, and the prostration caused by pain and insomnia.

**Diagnosis.**—It must first of all be determined that the eruption in question is essentially bullous. In the early stages, and sometimes for prolonged periods, the evolution of characteristic bullae is obvious. In addition, other bullous eruptions must be eliminated before diagnosing the case as pemphigus. An irregular outline of the bullae, and a special, perhaps unilateral, distribution in a young hysterical female, may suggest an artificial eruption. The bullous phase of erythema multiforme may cause difficulty for a moment, but the sites of predilection on the forearms and hands and face, the acute course, and admixture of erythematous lesions, will attract attention, though true pemphigus bullae will sometimes present a slight preliminary congestive stage, acquire a secondary erythematous zone, and leave reddened areas. The bullous phase of dermatitis herpetiformis may also for a time be very difficult to distinguish, but other types of eruption (papules, vesicles, or pustules) are generally seen intermixed, or characterise other outbursts, with or without bullae, and there is usually marked itching. A streptococcic vesicated eruption may closely simulate pemphigus, and in infants it has been frequently recorded as acute infective pemphigus. Streptococcic bullae are usually flaccid, and often extend eccentrically by an undermining of the cuticle by serum. In the later stages of pemphigus the characteristic bullous formation may be absent, and the eruption may appear as red, scaly, or weeping eczema-like patches, and at times similar diffuse sheets. Usually, however, careful search will sooner or later lead to the detection of attempts at bullous formation. It must also be borne in mind that the sites of bullae may be crusted, or covered with a diphtheroid coating, or exulcerate, or in rare cases take on a gangrenous process. The eruption may be localised to one site for a time, and may be confined to the mucous membranes for years; in this event the bullae are imperfectly formed, and are sometimes mistaken for aphthous or syphilitic patches. Lastly, in the established stages the damaged skin shews a want of cohesion between the rete cells, and slight trauma will cause the skin to slide away (Nikolsky's sign).

**Treatment.**—Our object should be first to institute a specific and direct treatment against the primary and essential cause or causes; secondly, to counteract the misery and strain of pain and insomnia, to maintain the patient's strength by suitable diet, and to correct such

incidents as anaemia and diarrhoea; thirdly, to keep the skin disinfected, soothed, and protected. In the absence of any definite knowledge of the etiology we have no specific treatment, and consequently all sorts have been tried.

Those who hold the nervous system to be primarily at fault employ such agents as quinine in large doses, strychnine injections, iron (especially when anaemia is prominent), glycero-phosphates, and arsenic in increasing doses short of its deleterious effects. Sir Jonathan Hutchinson has been all his life a thorough believer in the curative power of arsenic, and has regarded it almost as a specific, but the majority have not had such a happy experience, though many admit that in some cases it does control the eruption up to a certain point, and in England it is, I think, widely held that in children it is specially effective. Opium in judicious doses is often a valuable adjuvant in mitigating the wearing distress and insomnia of the patient. Radcliffe Crocker thought well of salicin. Those who believe that the disease is toxaemic and due to metabolic derangements advocate a strict diet, such as milk, reduction of the nitrogenous intake to a vanishing point, and the elimination of toxic products by the bowels and kidneys. A salt-free or a dechlorinated diet has also been tried. Again, if the isolation of a microbe from the contents of the bulla or from the blood suggest a possible cause vaccine treatment should be tried. Dr. Bunch, for example, obtained gratifying results by injecting a streptococcic vaccine. Winfield injected mixed staphylococci. The local treatment is important and necessitates constant care. In the first place, in severe cases it is desirable to protect the skin from injury by use of a water-bed. The skin should be kept clean and disinfected, to reduce the disagreeable odour of the discharges and to prevent a secondary toxaemia. Hebra's continuous bath cannot always be borne, and even soothing, alkaline, or mild disinfectant baths may be difficult. In any case, the skin must be kept gently cleansed. It is important also to protect the skin by occlusive dressings, such as the cremor zinci, afterwards powdered with potato starch, the gum varnishes, or Unna's glyco-gelatin. In other cases, muslin spread with salves can be spread over the body. Disinfectants must be carefully handled, both in baths and dressings, for carboluria, for instance, may be set up. The details of these dressings must vary, for weeping surfaces may require powdering.

Cassäet and Micheleau describe two cases of "pemphigoid" eruptions about the hands in which the urine was found to be greatly deficient in chlorides; a salt-free diet was instituted with disappearance of the eruption in a few days. They consider that the deficiency of chlorides in the urine points to the presence of toxaemia.

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PEMPHIGUS VEGETANS.—**Introduction.**—In 1886 J. Neumann of Vienna described this form of eruption under the name *Pemphigus vegetans*, and reviewed 9 cases. He pointed out that it had previously been regarded as of syphilitic nature by Hebra, Kaposi, Auspitz, and himself, on account of the changes in the mouth and the condyloma-like vegetations of certain regions. Bamberger, who detected bullae in a case of Neumann's, first insisted that the affection was essentially a pemphigus. In 1887 Sir Jonathan Hutchinson, in ignorance of Neumann's recent paper, described some cases, probably of a similar character, and Radcliffe Crocker published in 1890 a well-marked example and reviewed the recorded cases. In 1891 Hyde first recognised a case in the United States of America.

At the present date about 70 cases have been reported, but many of these are open to criticism as not conforming strictly to Neumann's picture. The distinction of the disease from certain cases of pemphigus and pemphigoids is difficult, as the only available data are the clinical features. Thus, the mucous membranes may be involved in pemphigus and the pemphigoids, and vegetations may occur in many vesicular, pustular, and bullous conditions. Vesicles are described in some instances, and in Sir D. Duckworth's interesting case the eruption was multiform with circinations and vesicles and bullae, thus recalling dermatitis herpetiformis. Various views are held. According to some observers it is only a pemphigus or pemphigoid, as the case may be, with vegetations; others, detaching with some difficulty various vegetating, vesicular, and bullous eruptions, consider that Neumann's pemphigus vegetans is special in its eruptive manifestations, and that its sites of predilection and its evolution thus demand a special notice.

**Etiology.**—The age of onset varies, but the disease chiefly falls on adults from thirty-five to forty-five years of age; it is sometimes seen in patients over sixty. Matzenauer and Riehl noted it at twelve and thirteen years of age respectively. Winfield gives the following summary: in 45 cases, twenty-four to sixty-seven years; 6 cases from twenty to thirty years; 16 cases from thirty to forty years; 16 cases from forty to fifty years; 6 cases from fifty to sixty years; and 5 cases from sixty to seventy years. Females are rather more frequently attacked; 31 females to 25 males (Winfield). The cause of the disease is still a matter of speculation.

**Morbid Anatomy and Pathogeny.**—The bullae, mostly formed by separation of the epidermis from the dermis, are apt to leave crusts composed of necrosed epithelium and a few leucocytes. On the excoriated surfaces, chiefly in the flexures, the papillae hypertrophy, and grow into condyloma-like vegetations. Leucocytes and serum are seen between the

epithelial cells. The vessels are enormously dilated, and, according to Unna and Darier, there is stenosis of the vessels and inflammation in the hypoderm. Ehrmann found the cell degeneration, formerly thought to be psorosperms, in the cells and outside them. Eosinophilia is a prominent feature in the blood and contents of the bullae. Many organisms have been isolated, but none has been proved to be the cause of the disease: *Staphylococcus aureus* (Marianelli); *Staphylococcus aureus* and *albus* (Pfeiffer); a coccus (de Michele); staphylococcus in blebs and a pseudo-diphtheria bacillus in the mouth and after death in the blood (Hamburger and Rubel); a diplococcus (Philippson); a diphtheria-like bacillus which killed rabbits in two cases (Waelsch, confirmed by Stanziale); streptococcus and bacilli (Gaston); streptococcus (MacCormac in Hebb's case); *Bacillus pyocyaneus* (Pernet); *Bacillus pyocyaneus* and *Staphylococcus aureus* in the blebs and blood (Winfield).

Various pathological conditions have been found at necropsies, but nothing shedding much light on the etiology. The urine generally contains a diminished output of nitrogen, and nephritis has been found, but this is perhaps secondary.

The *pathogeny* is purely hypothetical. A local infection has been suggested. Some observers, from a study of the evolution, bacteriology, and histology, are in favour of a general infection.

**Symptomatology.**—This so-called pemphigus vegetans is characterised by an eruption essentially bullous, although sometimes in the early stages the bullae are not a striking feature, with a special predilection for certain mucous membranes and the cutaneous flexures, and in the latter sites with a well-marked tendency to form condyloma-like masses. In its later stages the disease is complicated by a grave general state, and usually terminates in death in a few months or longer, either in a first attack or a recurrence. In a few cases recurrences have extended over three, seven, and ten years.

It is convenient to emphasise three stages in its course. The eruption begins locally, and is usually not preceded by any striking departure from health, nor ushered in by febrile and other constitutional disturbance. The onset is insidious. Winfield noted that the eruption commenced in the throat, mouth, or nose in 36 cases, *i.e.* in about half; on the genitals, inguinal regions, and lower abdomen in 10; about the nails forming whitlows in 6; in the axilla in 4; on the face in 3; and possibly in the urethra once. Couston's conclusions are very similar. Dysphagia has several times been the first symptom. It is specially noteworthy that the bullae on the mucous membranes do not form perfectly, but are represented by painful excoriations, often coated with a whitish membrane and simulating aphthae and syphilitic mucous patches.

After a variable interval of days or weeks, the so-called second stage ensues, as shewn by the establishment of the eruption in wider areas. When not primarily attacked the mucous membranes may be invaded later by bullae which may extend to the pharynx, larynx, and even to the rectum and oesophagus, as shewn by necropsy. In many regions,

but most frequently on the inguinal folds, the genital and anal regions, the lower abdomen, the axillae, about the umbilicus, and the commissures of the lips, bullae, in size from a lentil to a pigeon's egg, appear continuously or in crops. The contents are at first clear, but soon become puriform, rupture in a few days, and leave red excoriations with an oozing surface, which may crust over. Early in the course the excoriations in the flexures, and rarely in other parts, are specially prone to form reddish soft papillomatous masses exuding a fetid serosity, which may produce crusts and display about the periphery an undermined epidermis. As they continue to evolve the bullae may become confluent and form extensive excoriated or crusted patches; the formation of these excoriated areas, especially on regions pressed on in the prone position, is greatly facilitated in the course of the disease by the special vulnerability of the skin, known as Nikolsky's sign, which leads to the sliding away of the superficial skin on slight trauma. The generalisation of the eruption varies in different cases. On the scalp impetigo may be simulated. The nails are frequently implicated, distorted, and shed, or the beds inflamed. Pigmentation can be left by the lesions, and sometimes is a marked feature. In Sir D. Duckworth's case there was a remarkable keratotic hypertrophy of the palms and soles. In the so-called third stage there are fever, insomnia, diarrhoea, and a hectic state. Marasmus sets in, and these grave symptoms are associated perhaps with an infective state, or, at any rate, with the great difficulty in swallowing food, the toxaemia from absorption, the loss from albuminous discharges, the insomnia, etc., and death usually terminates the scene. The eruption may largely subside before death. Some cases recover from certain attacks, but tend to relapse at some future date.

**Prognosis.**—As already stated the outlook is nearly always very grave.

**Diagnosis.**—As a whole, pemphigus vegetans has a special physiognomy in its localisation, evolution, course, and termination. In the early stages when there are patches on the mucous membranes diagnosis may be difficult, and even with the added condyloma-like growths in the flexures cases have been regarded as syphilis. For a time it may be quite difficult to find bullae, and the case must be watched. Pemphigus and pemphigoids, and even impetigo contagiosa and iodide eruptions, may be associated with vegetations, and induce hesitation in the diagnosis until the case is observed further; for it must be remembered that the mouth, groin, and the lower abdomen may be specially picked out in these affections.

**Treatment.** — As neither arsenic nor other drugs can control the eruption, and as no micro-organism has yet been proved to be the cause of the disease, treatment can only be directed to the relief of the patient's sufferings. In observing the effects of treatment we must bear in mind the possible quiet periods of the eruption. Opium in large doses has been recommended. Locally the skin must be kept as free as possible from secondary infection, by the greatest cleanliness, if possible

by a continuous bath or as much bathing as the patient can stand, but baths are said by some to determine bullous outbursts. When the skin is cleansed, occlusive dressings should be applied in the form of cremor zinci or other preparation, and it can be afterwards powdered with potato starch. The mucous membranes will call for cleansing and antiseptic washes. The vegetations have been scraped away, but they can be removed gradually by less severe measures, such as tincture of iodine in chloroform (Unna), powders composed of talc, savin, salicylic acid, 5 per cent argyrol and weaker for the mouth, and a mild resorcin ointment (Ravogli).

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PEMPHIGUS FOLIACEUS.— **Introduction.**—In 1844 Cazenave described as *Pemphigus foliaceus* a rare dermatosis (illustrated in his *Atlas*) primarily bullous, but in which the bullae are badly formed and flattened; having a tendency to degenerate into a condition like that of general exfoliative erythrodermia with more or less lamellar scaling, though somewhat humid, with here and there vestiges of abortive bullae (Brocq). This definition was framed before the pemphigoids were separated from pemphigus, and a study of the literature shews that a considerable number of the pemphigoids passing into the pemphigus foliaceus type have been included. If we accept this separation, there is logically no reason to erect the pemphigus foliaceus phase into a distinct disease. It is, however, desirable to give a special description of the condition in which the skin tends to be so universally involved and damaged that the bullae can no longer be properly formed, and thus the aspect of an exfoliative dermatitis is brought out, though in certain spots and stages imperfect bullae may occasionally be detected. So in a condition such as weeping eczema the perfect vesicles will cease to form.

**Etiology and pathogeny** are obscure. In Lansac's 30 collected cases there were 20 females and 10 males. It attacks adults and even elderly people. Hardaway's patient was eight months pregnant. Various etiological hypotheses have been framed. The nervous conception is founded on the record of antecedent mental shock in a few cases, on the discovery of nerve lesions at necropsies, and perhaps on the apparent

absence of other causes. Brocq gives the lesions of the cord found as obliteration of the central canal, pigmentation of the meninges of the cervical region with thickening of the connective tissue, the prolongations of which penetrate across the zone of Lissauer, myelinic oedema at the periphery of the dorsal cord, oedema of the anterior horns, sclerosis of the posterior columns with degeneration of nerve-fibres, degeneration of nerve-fibres in the posterior roots, and fragmentation and disappearance of myelin in some nerves. These changes, however, are not constant, and may be secondary or complications. Leredde put forward the view that in pemphigus foliaceus, pemphigus vegetans, and dermatitis herpetiformis, the eruption is secondary to blood-lesions produced in the bone marrow (haemodermatitis). The toxic or auto-toxic conception appeals most to Cranston Low, and Audry and Lansac suggested toxins which irritate the sensory nerves at their origin in the grey substance, causing atrophy of the posterior horns and degeneration of the subcutaneous nerve-fibres. Lastly, a parasitic cause, local or general, has been suggested, but so far as investigation has gone any organisms found were probably secondary. Pecori isolated the *Bacillus pyocyaneus*.

**Morbid Anatomy.**—In an established case there is evidence of inflammation, with rapid exfoliation of the surface layers. The rete is reduced in bulk, with its individual cells swollen, softened, and oedematous, with the intercellular spaces dilated and containing migratory cells in the exacerbations. Leredde found that the migratory polynuclear cells here were mostly eosinophil. The cells on the interpapillary cones present caryokinesis. The corium shews great dilatation of the blood-vessels, lymph-vessels and spaces, most marked, Unna says, in the sub-papillary plexus, but extending deeper. The connective tissue is oedematous and swollen, and may shew colloid and hyaline degeneration (Unna). There is cellular infiltration in the superficial corium, consisting of plasma cells, lymphocytes, polymorphonuclear leucocytes, and some eosinophils. Pigment cells and free pigment have been noted. The sweat glands atrophy, and the sebaceous glands may shew cystic degeneration (Senelew). The fat undergoes colloidal changes and disappears (Unna). Fabry and Senelew report marked diminution of elastic tissue in the deep parts, and total absence in the more superficial parts, but Nasarow found it increased. This diminution of elastic tissue is interesting in connexion with a similar condition observed in some cases of epidermolysis (*vide* p. 463).

**Symptoms.** — The bullae vary in character at different stages of the malady. Cases are distinguished as primary in which the bullae from the outset have special characters, whilst in others the imperfect formation of bullae is secondary and the foliaceus phase is installed on an existing eruption, characteristic of pemphigus vulgaris or a pemphigoid. Brocq recognises the following forms :—

A. Bullae flaccid from the start, or, if the earlier ones are distinctly formed, imperfectly formed lesions soon take their place. (*a*) A sub-variety

in which flaccid bullae are long recognisable, and then (i) they may be discrete, becoming fixed like wafers on the skin, and leaving brown macules; evolving by successive outbursts and after a time nearly always giving place to a condition (ii) in which the bullae are crowded, and become confluent to establish, by constant recurrence on the damaged skin and extension over wider areas, a very special picture, namely, a generalised or universal red surface covered with irregular lamellar scales, attached by their centres or edges, mostly a little moist, with new attempts at bullous formation in certain places where the epidermis is slightly raised by a little serum and easily glides away under the pressure of the finger. The dermis, as in other phases, may, after a while, slightly proliferate and take on what has been described as a papillomatous state. This term suggests a picture seen in pemphigus vegetans, but in pemphigus foliaceus the skin becomes "granular-looking with an exaggeration of the natural folds" (Low), and there may be hyperkeratosis of the palms and soles, apart from arsenical treatment, as in other phases of pemphigus. Brocq has seen this hyperkeratotic papillomatosis develop in dermatitis herpetiformis and in a case of pemphigus foliaceus. The serous exudation is associated with a penetrating fetor. (*b*) A sub-variety in which flaccid bullae are abundantly formed and generalised, and are recognisable for a short period only. The established condition simulates a generalised exfoliative dermatitis, but with smaller scales for the most part.

B. (*a*) The bullae at first are like those of ordinary pemphigus; well filled with transparent contents, arising directly from the skin without antecedent phases, and presenting all the characters of true pemphigus chronicus. After a variable time the bullae assume the flaccid type more and more, and by confluence and extension the picture of pemphigus foliaceus is established (*herpès maligne exfoliative* of Bazin consecutive to pemphigus). (*b*) A similar condition may be secondary in the pemphigoids.

The picture of the eruption is thus characterised essentially by the formation of bullae (or vesicles if pemphigoids are included), which may vary in type from the outset in the primitive and secondary forms, and may change in type from the tense bulla to the flaccid; and, as the eruption progresses and the skin becomes more or less universally involved, the proper formation of bullae is still more prevented and comes to be represented by slight lifting of the corneous layer by serum here and there, or by scales or crusts, or oozing of serum with a fetid odour, on a reddened skin, simulating a generalised exfoliative dermatitis, and a little thickened and oedematous in places. Probably this congested condition of skin is itself responsible for some exfoliation. The scales are variable in aspect, form, and consistence, rarely furfuraceous, generally lamellar, and not imbricated, constantly falling and forming again. In other phases crusts, generally thin, appear, and in the presence of constant pressure ulceration may occur. The skin of the face may retract and lead to ectropion and eye trouble. Nikolsky insisted on the presence of a

special vulnerability of the skin ("phlyctenoid keratolysis" of Besnier), so that slight trauma will cause the superficial layer of the skin to slide off. This condition, however, is not special to pemphigus foliaceus, though it is very well marked. Dubreuilh says this acantholytic condition explains the mechanism of pemphigus foliaceus, but I think also that bullae cannot form properly on the injured skin. The mucous membranes may be involved, but this does not seem to be a notable feature. The hair may be more or less lost, as may the nails, which may become dystrophic.

The sensory disorders, apart from the phases originating in pemphigoids, are not usually very well marked. There is often some febrile disturbance, and this is increased with the occurrence of the exacerbations which mark the progression of the malady. At such times the skin gets redder and may ooze more freely, bullae may be detected, and Nikolsky's sign is increased. There is hypazoturia as in other similar conditions, but examination of the urine has not thrown much light on the etiology. The general health may be wonderfully preserved for a long time considering the severity of the eruption. Gradually, however, the health tends to fail markedly; marasmus sets in with diarrhoea; and the patient often succumbs, either from results of the malady, such as uraemia, or from complications such as pneumonia, septicaemia, or pyaemia. Hallopeau and Constensoux noted a marked osteomalacia, and Audry and his pupil Lansac the acquisition of skoliosis. Investigators have not obtained constant results pointing to any important change in the blood, and there is sometimes a remarkable variation in the leucocyte count on different days. Dr. Cranston Low notes a marked eosinophilia in 6, and a diminution in 3 cases.

**Prognosis.**—This is on the whole bad, and cures are exceptional. Besnier put the gravity between true pemphigus and the pemphigoids. The disease varies greatly in duration. It may run its course in a month or two, but most cases go on for two to ten years, and a cure may result.

**Diagnosis.**—The stages of obvious bullous formation and universal erythrodermia present their special difficulties. The difficulty in the bullous stage is chiefly as regards severe chronic pemphigus and bullous dermatitis herpetiformis. The formation of flaccid bullae, and their confluence and extension, will be suggestive. In the universal erythrodermia stage it may be very difficult to detect bullae, and careful observation over a prolonged period must be maintained. The trained observer, however, will note the slightest indication of a bulla, or the result of the process in the formation of moist greasy flakes and the striking fetor. When the case is in the erythrodermia stage, a history of a bullous period may help. It will be obvious that in this late stage the various exfoliative dermatitides are simulated. Large tracts of skin may suggest weeping eczema.

**Treatment.**—The course of the eruption is not amenable to any known medicinal means, and all that can be done is to support the patient's health by careful nursing and dieting, and the administration

of quinine and other tonics. Locally, a great deal can be done to relieve the patient and prevent secondary infection and intoxication. A water-bed is most desirable, and the continuous bath seems desirable, but Besnier did not think well of it as the skin was macerated and the eruption seemed worse. Baths, however, should be given as often as the patient can bear them, in order to keep the skin clean; Dr. Cranston Low found good results from starch baths containing a little permanganate of potassium. After cleansing the skin by a bath or otherwise, it should be dressed with vaseline, boric acid or zinc ointment, or similar preparations, spread on linen, muslin, or lint. A very convenient application is cremor zinci, made with equal parts of olive or almond oil and lime water, and thickened with oxide of zinc, or, if rather too drying, a little lanoline may be added. When dried up as much as possible, the surface may be powdered with potato starch. A word of warning may be added about the danger of absorption of carbolic acid and other strong agents applied to this damaged skin.

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## PEMPHIGOIDS

By T. COLCOTT FOX, M.B., F.R.C.P.

**Introduction.** — In the past a number of eruptions were recorded under such names as *Pompholyx* or *Pemphigus pruriginosus, P. herpetodes, P. à petites bulles, P. circinatus, P. composé, P. arthrique*; as *Herpes pemphigoides, H. circinatus bullosa, H. généralisée febrile, acute generalised Herpes, H. gestationis*; as *Impetigo herpetiformis*; and as *Hydroa bulleux.* Tilbury Fox felt the difficulty of classifying such cases with the erythemas, herpes, or pemphigus, and he attempted in a paper, published in 1880 after his death, to clear up the chaos by forming a separate group under the heading Hydroa, and he illustrated his conclusion by a record of cases. He defined this group as characterised by superficial inflammatory eruptions with the following features: (1) A marked tendency to multiformity of aspect not merely due to the different stages of evolution of the lesions, or to the presence at one period of different elementary lesions, but to change of type in the course of a given attack or in successive outbreaks. The predominant elements in most cases are

vesicles of varying size which form *ab initio*, or in a less intense process constitute papulo-vesicles, or remain as prurigo-like papules. A further modification of the vesicle is a more or less rapid formation of pus in its contents. In other cases bullae may be added or predominate. Another feature of the multiformity in some cases may be the evolution of actively congested (often called erythematous) patches of various sizes, which generally become surmounted by a single or many vesicles or pustules, simulating patches of herpes. Such congestive patches may extend peripherally, and become marginate or circinate, and little vesicles may form on the borders or beyond. By confluence these patches may form extensive irregular or gyrate tracts. As vesicles dry up into small scales and pustules into crusts, areas simulating dry or weeping eczema may be formed. True urticaria may evolve, or be simulated by urticated papules and congestive patches. (2) Although the lesions might be disseminated without order, the author attached importance to the marked tendency to the grouping of lesions in twos, threes, and more, and to the herpes-like vesicular patches. This feature was characterised as herpetiform. (3) Disordered sensation, such as pain, burning, and especially itching, is another striking feature of varying intensity, sometimes paroxysmal and intolerable, accompanying the eruption or preceding the outbreak. The consequences of scratching and rubbing are seen in excoriations, blood crusts, and indurations of the bases of lesions which are denominated "pruriginous spots," namely, prurigo-like. (4) The distribution tends to be more or less symmetrical and widespread and even generalised, but in comparatively mild cases and in quiet periods it may be more localised. In one case the mouth was affected. (5) The affection tends to chronicity by successive outbursts at varying intervals, or by continuity with comparatively quiet periods. Widespread outbursts may be sudden, and are often introduced or accompanied by general malaise. (6) The general nutrition is often comparatively well preserved. (7) The prognosis varies; some cases recover, some severe cases prove fatal. (8) Tilbury Fox believed it to be a neurotic affection.

These cases were divided for convenience into three groups, though no definitive distinction existed between them, namely, *Hydroa simplex*, *H. herpetiforme*, and *Hydroa pruriginosum* or *bullosum*. I have always felt doubtful about some of the cases included under hydroa simplex. This memoir attracted but little attention, and was almost completely overshadowed by Duhring's subsequent publications.

In 1884 Duhring of Philadelphia described the principal features of a protean group of eruptions, which he had studied for some years, and concluded that they were forms of one pathological process. To this group he gave the name *Dermatitis herpetiformis*, and subsequently published a series of illustrative cases, and added some portraits in his *Cutaneous Medicine*, 1898, Part II. Like Tilbury Fox, he included herpes gestationis, and for a time impetigo herpetiformis (Hebra-Kaposi). His definition will be noted to correspond in all its main features with that of Tilbury Fox. The elementary lesions might be erythematous,

maculo-papular, papulo-tubercular, vesico-papular, vesicular, vesico-bullous, bullous, or pustular; and, as a rule, all have peculiarities which distinguish them from manifestations characterising other well-known diseases, as the erythemas, herpes, and pemphigus. (1) A tendency to multiformity existed in nearly every case, and the type might change in the course of an attack or in different attacks, and without any orderly sequence. (2) Herpetiformity was variable, but a chief characteristic, *i.e.* the arrangement of vesicles in small groups and clusters, is a typical and the commonest manifestation. He also describes blebs surrounded by little vesicles, and notes the puckering of vesicles as in herpes, and says they may refill after rupture. (3) Disordered sensation, especially itching, is a marked and constant symptom, and so intense when the eruption is profuse that excoriations result. (4) The course of the malady in almost all cases is chronic, and characterised by more or less distinctly marked, gradual or sudden, exacerbations or relapses at intervals of weeks or months. Severe cases may present prodromes, such as malaise, constipation, febrile disturbance, hot and cold sensations, and itching. Any part of the body may be attacked, and one case commenced in the mouth. The sexes are about equally affected. All the patients except one were adults. Duhring emphasised the predominance of the cutaneous lesions in different cases or stages of a case by describing *erythematous*, *vesicular*, *bullous*, *pustular*, *papular*, and *multiform* phases.

In 1888 Brocq wrote an elaborate monograph on the subject, reviewing Duhring's conclusions and analysing many of the records. He proposed a rather more extended group under the name *Dermatites polymorphes douloureuses*, but included some only of the cases reported as impetigo herpetiformis. His group was characterised clinically by (1) disordered sensation (phénomènes douleureux) of variable intensity, but nearly always much accentuated, often out of proportion to the eruptive phenomena; (2) an aspect habitually polymorphic, namely, erythematous, circinate, erythemato-vesicular, erythemato-bullous, sometimes urticarial, papular, pustular, having sometimes a disposition truly herpetiform, sometimes simply grouped, but occasionally disseminated, and he did not attach the importance to herpetiformity that Duhring did; (3) a marked tendency to evolve by successive outbursts; (4) habitual conservation of a general state of health out of proportion to the intensity of the eruptions and violence of the sensory disturbances, though rarely there is a fatal termination. He subdivided the group into acute and chronic cases with successive outbursts and the recurrent type of pregnancy (herpes gestationis), though there were numerous facts of passage. Bowen regards recurrence in separate attacks as the most characteristic feature.

The formation of these groups, variously named *Hydroa*, *Dermatitis herpetiformis*, and *Dermatites polymorphes douloureuses*, has not received universal acceptance. Until the causation of these eruptions is known there is little more than the clinical features to help us. Some critics, however, go so far as to acknowledge that the proposal has a certain

clinical convenience. Many of the types included were formerly grouped under the erythemas, chronic urticaria, and especially pemphigus. Kaposi protested against the abstraction from these groups, and held that the formation of a new group only causes confusion, and this view was supported by Radaeli.

HYDROA (Tilbury Fox); DERMATITIS HERPETIFORMIS (Duhring); LA DERMATITE POLYMORPHE PRURIGINEUSE CHRONIQUE ET SUBAIGUË (Brocq); PEMPHIGUS HERPETIFORMIS (Stelwagon).

**Etiology.**—This uncommon eruption may occur at any age, but it is chiefly seen in adults. There is no real predominance in either sex. Some observers follow Tilbury Fox and Duhring in thinking that it is produced by the agency of the nervous system, and they are influenced in this conclusion by the characters of the eruption, the disordered sensation, and the absence of any other definite cause. In some striking recorded cases the eruption has followed worry, profound emotion, and shock, as in lichen planus, and it has been observed to be influenced in its course by similar agencies. Two of Tilbury Fox's cases eventually died insane. Milian pointed out the presence in a case of nervous symptoms, namely, exaggerated patellar jerks, crises of weeping and of laughter, inequality of the pupils, and left mydriasis, with paresis of reaction to light, and a lymphocytosis of the cerebrospinal fluid. Jeanselme and Gastou also observed nervous symptoms. There is no proof of an infective process, and necropsies have not helped us, though complicating morbid conditions have been met with. Other observers fall back on the hypothesis of a primary auto-intoxication, and the urine has been carefully examined for evidence, but without affording any decisive proof. Engman has pointed out that indicanuria is more marked in the outbursts. Winfield had a curious experience in seeing four cases with glycosuria.

**Morbid Anatomy.**—Gilchrist describes the process of vesicle formation as commencing by vascular dilatation, especially concentrated about the papillary layer. This is followed by exudation of serum and polymorphonuclear leucocytes and eosinophils. The infiltration causes a separation of the epidermis from the dermis and the vesicle is thus formed mechanically. The epidermis over the vesicles is also altered by the exudation. Fordyce recognised a similar infiltration of the papillary layer, but found that the vesicles were intra-epidermic. The cells of the infiltration are polynuclears, mononuclears, and eosinophils. It is an acute inflammatory process. Du Mesnil, in a case diagnosed as impetigo herpetiformis, found the pustules intra-epidermic. Darier says the erythema plaques are due to congestion with pronounced oedema and abundant diapedesis in the papillary body, and that bullae are formed by sub-epidermic rupture, or are sub-corneal, or by confluence of vesicles. There is high percentage of eosinophils in the blood, in the contents of the vesicles and bullae, and in the infiltration of the lesions; Leredde thought that it was brought about by the action of various toxic bodies

on the leucoblastic organs, especially the bone marrow. Micro-organisms have been found, especially in old lesions, but no definite causal connexion has yet been established.

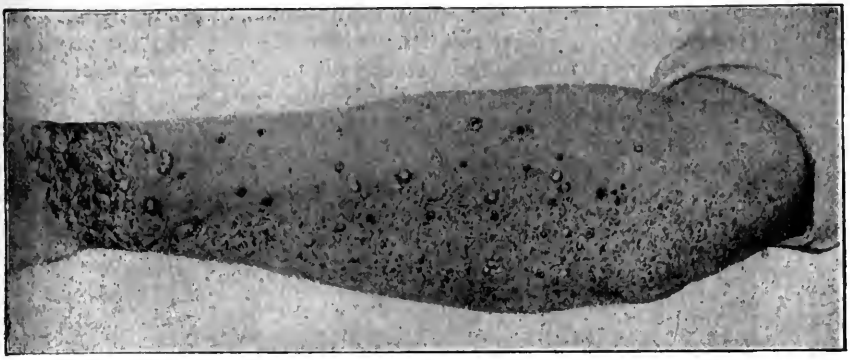

FIG. 92.—Hydroa of Tilbury Fox. Disseminated and grouped vesicles. The man died insane after some years. (Case viii. "A Clinical Study of Hydroa," Tilbury Fox, *Arch. Dermat.*, Phila., 1880, vi. 16.)

**Symptoms.** — The distinguishing characters of this group have already been discussed. It must, however, be clearly understood that, although a particular phase may predominate or be exclusive at a

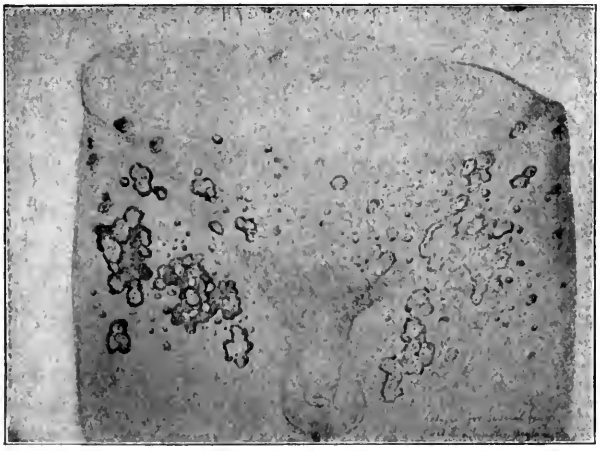

FIG. 93.—Hydroa of Tilbury Fox. A pustular circinate phase in a man who died insane after successive attacks extending over many years. (Case v. "A Clinical Study of Hydroa," Tilbury Fox, *Arch. Dermat.*, Phila., 1880, vi. 16.)

particular time, it is characteristic for different phases to coexist or succeed one another. Vesicles are the most frequent elements. In size they may vary from a pin's head to a pea, and are flat or raised; they are often irregular in shape or with a puckered periphery, firmly distended,

and, as a rule, without a red areola unless crowded, and then appear to be formed like a zoster patch on a congested ground. Minute translucent vesicles sometimes require a careful search for demonstration, especially on the borders of circinations and scaly and weeping patches. In a less intense process reddish papules may form and remain as such, or gradually become capped by fluid. In a typical case I have seen the more intense eruption pass after some years into a uniform chronic prurigo-like eruption (Fig. 94). Pustules are often formed secondarily from vesicles, but this change is often difficult to follow, and pustules sometimes appear to be primary. They may shew umbilication. Papulo-pustules (acneiform) may form.

Such lesions may be scattered about without order, but are specially

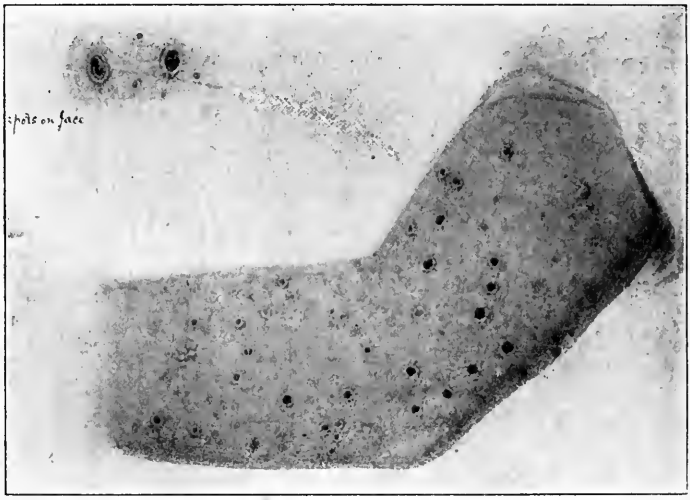


FIG. 94.—Hydroa of Tilbury Fox. Vesicular eruption with a tendency to form groups. Under my observation it passed into a chronic prurigo-like eruption. (Case ix. "A Clinical Study of Hydroa," Tilbury Fox, *Arch. Dermat.*, Phila., 1880, vi. 16.)

apt to occur in herpes-like bunches of two, three, or more. They are also sometimes seen arranged in rings or segments of circles without marked redness.

Another less common phase of eruption is the red congestion or so-called erythematous lesions, which may sometimes be urticarial. The red patch may be the seat of a bulla, vesicles, or pustules. In some cases there is a marked tendency for these lesions to extend peripherally, fresh vesicles or pustules continually forming at the border, while the older central parts desquamate, or crust, or form weeping and finally pigmented surfaces. These various patches may join and form more or less large, irregular tracts, and in extreme cases with a constant new formation of similar lesions may be generalised or even universal, and simulate exfoliative dermatitis or pemphigus foliaceus. Lastly, bullae may be present, in size from a pea to a cherry or walnut, often without

any reddened base, frequently somewhat irregular in outline, tense and convex, or flaccid and flattened. Bullae may also form from confluent vesicles and pustules, and may have grouped around them other vesicles, blebs, or pustules. The contents of the bullae may become puriform or sanguineous. As in other vesicular, pustular, and bullous eruptions, vegetations may develop. In addition, as the eruptive lesions become

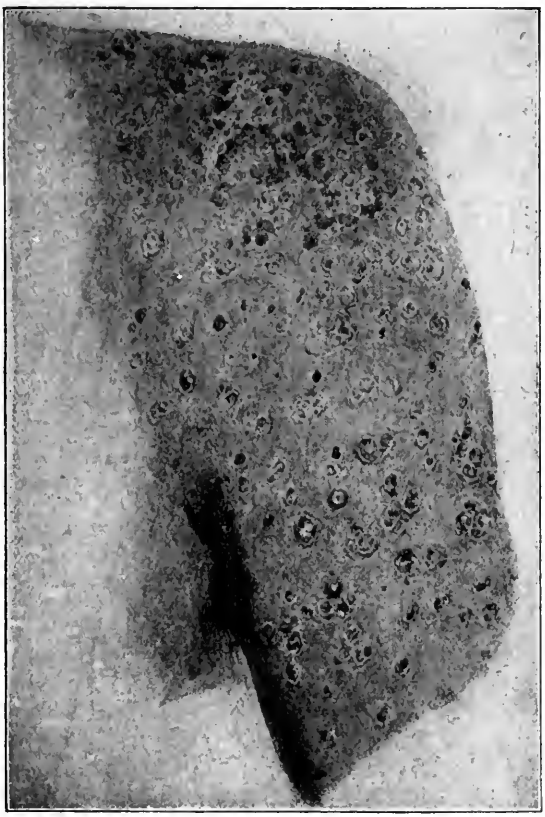

FIG. 95.—Hydroa of Tilbury Fox. (Case vii. "A Clinical Study of Hydroa," Tilbury Fox, *Arch. Dermat.*, Phila., 1880, vi. 16.) The late Dr. Sangster observed a pustular circinate phase in this man.

contaminated with organisms, auto-inoculation of the skin will probably occur. The amount of the eruption may, for a time at any rate, be comparatively scanty, and localised to certain regions. More frequently it is copious and widely distributed, and in some cases generalised or rarely universal. The muco-cutaneous surfaces may be invaded, and the nails affected. The eruption may start in almost any situation, even in the mouth. Disordered sensation, chiefly itching and burning, is generally a notable feature, sometimes intense, sometimes paroxysmal; this leads to

rubbing, scratching, and tearing of the lesions, and the formation of excoriations and crusts of blood. The disordered sensation may precede the eruption.

Constitutional symptoms, such as fever, general malaise, vomiting, and prostration, may accompany the course of the malady, but are usually more marked with the onset of outbursts.

FIG. 96.—Circinate vesicular phase of hydroa (Tilbury Fox), with confluence into diffuse, scaly, or moist areas; the patient, under the care of Mr. J. R. Lunn at the St. Marylebone Infirmary, died with the eruption. Such cases have been described as pemphigus foliaceus or pityriasis rubra.

The course is usually chronic, marked by successive outbursts lasting weeks or months, and separated by irregular intervals of comparative quiet or freedom.

**Diagnosis.**—In the first place attention must be drawn to the occasional difficulty of making a definite diagnosis in a first attack; and it is then often necessary to reserve our judgment for further observation. A history of previous attacks will be of great assistance, for

recurrences are characteristic. The erythematous, erythemato-vesicular, and erythemato-bullous phases may obviously simulate the true erythemas, including the bullous and iris phases, the sites of predilection of which are on the hands and face, but are liable to recur. It must be borne in mind that in some recorded cases eccentrically spreading erythemato-vesicular patches are so incessantly evolved and become so confluent and generalised that exfoliative dermatitis and pemphigus foliaceus have been simulated. A case under my observation was for several years in two London hospitals under the care of two eminent physicians interested in diseases of the skin, and was diagnosed as exfoliative dermatitis. At a later date the intensity steadily declined, and I observed over and over again the formation of circinations of vesicles, which ran together to form more or less diffuse desquamating sheets. The disease ceased after many years, but seemed to keep its type throughout (*vide* p. 338). Reference has been made to the prurigo-like aspect of another case steadily declining in intensity, and such phases have to be distinguished from recurrent hydroa aestivale, Brocq's acne excoriata, and the so-called prurigo diathésique. Individual herpetiform clusters and circinations may suggest herpes or vesicular ringworm, but the whole course is different. In extensive cases weeping tracts are formed, and the presence elsewhere of tiny vesicles with burning and itching may imitate eczema.

*The pustular form* has been diagnosed as scabies. The difficulty really arises when the clustered pustules and eccentrically spreading patches margined with pustules display a similar picture to that of impetigo herpetiformis. In the male and in women not pregnant, if the latter disease exists in such persons, it is not easy to draw a very definite distinction on clinical grounds alone. Some of the cases, described as impetigo herpetiformis, by a change of type in their course have suggested that they were really pustular forms of dermatitis herpetiformis. In this connexion the reader should refer to the remarkable case (illustrated) recorded by Fordyce. Here it may also be noted that at the International Congress of Dermatology of 1889 Hallopeau presented a woman suffering from what he considered to be a new type of eruption, under the title of *Dermatite pustuleuse chronique et végétante en foyers à progression excentrique.* Later he added two further cases; but one of these at any rate was diagnosed by others as dermatitis herpetiformis, and Hallopeau eventually decided that his cases were examples of pustulating pemphigus vegetans (Neumann).

*The bullous phases* may be very difficult to distinguish from what is now known as pemphigus. In dermatitis herpetiformis, however, though a pure bullous eruption is certainly rare, it cannot be said that it never occurs, and usually the bullae are mixed with other phases, and are apt to be grouped, often have a red base, are associated with notable disordered sensation, and in another attack a different phase may be observed. Bowen of Boston has studied fifteen cases of recurrent vesicular and bullous eruption in children, but he noted that if it was dermatitis herpetiformis we must recognise the wholly lacking element of multi-

formity, the slight degree or absence of disordered sensation, and the predilection for certain sites, such as the nose, mouth, eyes, backs of the hands, wrists, backs of the ankles and feet, and the genital region.

The **prognosis** varies. Some cases are comparatively slight and of short duration, but most are chronic by successive outbursts. We have spoken of the constitutional symptoms, and the intense irritation in many cases interferes so much with rest that it cannot fail to bring about prostration. Although Brocq insists that it is characteristic that a relatively good state of health is preserved, many fatal cases are on record.

**Treatment.**—In the absence of definite knowledge of the cause and of a means of cure, our efforts must be directed (1) to support the strength of the patient by careful nursing and dieting and tonic treatment until the storm happily passes; (2) to allay the irritation, sometimes intense and prostrating, as far as possible, and so obtain restful sleep; (3) to keep the patient as comfortable as possible, and free from auto-intoxication, by thorough cleansing of the skin from the fetid discharge or crusts, by continuous or occasional baths, or hand bathing according as the patient can bear these operations, and by protecting and soothing the inflamed parts by local applications, especially occlusive dressings, such as the cremor zinci followed by powdering with potato starch. Many physicians, acting on various views as to its causation, try to tone up the nervous system by arsenic, large doses of quinine, and so on; or endeavour to counteract any auto-intoxication by special dieting and attention to the bowels and the state of the kidneys and the urine. If a special organism can be isolated opsonic treatment may be employed.

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## HYDROA GESTATIONIS

SYN.: *Pemphigus Gestationis* (Kaposi); *P. pruriginosus* (Hardy and Chausit); *Herpes Gestationis* (Milton); *H. circinatus bullosus* (E. Wilson); *Hydroa Gestationis* (Liveing); *Hydroa Gravidarum* (Unna); *Erythema Gestationis* (Cottle); *Erythema Gestationis bullosum* (Pye-Smith); *Dermatite polymorphe prurigineuse récidivante de la grossesse* (Brocq); *Dermatite herpétiforme gravidique.*

**Etiology.**—The remarkable feature is that this eruption has occurred for the most part during the course of pregnancy, and may appear from the third or fourth week, but usually after the tenth week. In a few cases it has been recorded as starting shortly after delivery, though there may have been antecedent sensory disorders. In other women both these phases may be observed in different attacks. Any pregnancy may be so complicated, and in one instance the eruption first appeared in the eighth. There is a strong tendency to repetition in successive pregnancies, but some may be free. The more often pregnancies are accompanied by this

eruption, the earlier it appears as a rule. No special ill-health has been traced in the antecedents of these patients, but in one there was a history of attacks of urticaria after eating fish. It may occur at any age between twenty-one and thirty-nine years. Many authors regard it as a neurosis determined by the state of the uterus, and emotions and privation are said to accentuate it: others suggest a toxaemia. Dr. H. French says that herpes gestationis, like other bullous diseases, exhibits eosinophilia.

**Symptoms.** — This pemphigoid eruption corresponds closely with dermatitis herpetiformis in its morphology, multiformity, so-called herpetiform disposition of the elements, its progression by successive outbreaks, the accompanying more or less marked disorder of sensation, and the relative preservation of the general health considering the worry and

FIG. 97.—*Hydroa Gestationis.* Second attack in successive pregnancies.

want of rest provoked. Another argument for the inclusion of this affection with dermatitis herpetiformis is that the eruption may persist for a considerable time independently of pregnancy.

It commences chiefly on the extremities, but also about the umbilicus, the breasts, and elsewhere; and the sites may vary in different attacks. Exceptionally the eruption may remain comparatively localised, but, as a rule, it tends more or less quickly to be widespread or generalised. The mouth, throat, and vulva may be implicated. It may advance continuously with quieter periods, or usually by successive outbursts. The latter may be preceded by itching, burning, and pain, and more or less febrile disturbance with shivering and sweats.

The eruption is essentially multiform, but one phase may predominate at some stage. Vesicles are frequent and may form little groups, or tend to evolve eccentrically and so form rings. Papules may be seen and these may become vesicated. Bullae may arise *ab initio*, or by enlargement or confluence of vesicles. Again, erythematous

papules and patches occur, and these may be surmounted by vesicles or bullae, and may spread eccentrically. Vesicles dry into scales, and any pustular elements into crusts, and when they fall they leave some temporary redness and often pigmentation. By confluence the eruption may form extensive patches and figured patterns. The nails may be involved.

The disordered sensation may be comparatively slight, but is generally marked and distressing, and apt to be paroxysmal. The eruption may disappear before accouchement, but may recur. It usually ceases on the second or third day after delivery or when lactation is established, but may persist for some weeks or months. It may recur in the intervals between pregnancies. There is often an aggravation of the eruption on the second or third day after delivery, and then bullae are apt to be conspicuous.

**Prognosis** is favourable, but abortion may occur, or the child may die soon after birth.

**Diagnosis.** — Impetigo herpetiformis is also associated in women with pregnancy or accouchement, but it differs in being a pustular eruption throughout. The eccentric spread of collections of pustules with the formation of crusted patches bordered by fresh pustules is a patterning seen in hydroa gestationis and dermatitis herpetiformis. Impetigo herpetiformis is associated with intense fever, a grave general state, and death is the rule in women. Some cases of so-called *prurigo gestationis* may possibly be a mild form of the disease under consideration.

**Treatment.**—Little can be done to control the eruption by drugs, but arsenic may be tried, and J. F. Payne thought favourably of increasing doses of extract of belladonna. For the rest the patient should be carefully nursed, and tonic remedies such as quinine and iron should be given. Hypnotics may be called for. Other indications are to keep the skin disinfected, and to try to give some relief from the itching and burning caused by the eruption.

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### Impetigo herpetiformis (Hebra-kaposi)

**History.**—In 1872, Hebra gave a short description, founded on 5 cases, of a rare and grave eruption, pustular throughout its course, prone to form eccentrically spreading patches, and special to women pregnant or recently confined. It was first called herpes impetiginiformis, and a picture of a case was published in Hebra and Bärensprung's *Atlas* (Taf. 8) under the name Herpes circinatus. Then came an important paper by Kaposi in 1887 (illustrated by chromo-lithographs) based on 12 cases observed at the Vienna clinique, mostly occurring in the last months of pregnancy and usually terminating in death. In all these earlier cases, and in some published later, the association with pregnancy or the puerperium was one of the dominant features, as in hydroa gestationis. Kaposi, however, also described a case in a male, and Dubreuilh, in 1892, in his important review, recorded another example in a male, and there are now quite a number reported. In addition, cases were described in women apart from pregnancy, and in some of these there was at some stage a change of type from the purely pustular. If such cases are admitted it is evident that the definition of the group, and its distinction from eccentrically spreading pustular forms of dermatitis herpetiformis, including hydroa gestationis, must become increasingly difficult. Gunsett in 1901 collected 28 cases, 19 of them in puerperal women, 8 in men, and 1 in a woman not pregnant.

**Etiology.**—The cause has not been definitely determined. According to one view the eruption is the outcome, as in hydroa gestationis, of a reflex neurosis determined in predisposed persons by the pathological state of the uterus. If, however, we include female cases unconnected with pregnancy and male cases, the state of the uterus can only be recognised as a powerful factor in certain instances. Infection and toxaemia have been suggested, but necropsies have failed to supply satisfactory evidence of such a cause.

**Morbid Anatomy.**—The erythematous patches shew dilated lymphatics and blood-vessels surrounded by cellular infiltration, which extends widely in the dermis and is a very prominent feature under the pustules. The interpapillary processes may be enlarged. The migratory cells traverse the epithelial layers and accumulate beneath the corneous layer to form the pustules. As might be expected, a number of organisms have been cultivated from the eruption, especially staphylococci, but there is no proof that any one organism is the direct cause. In necropsies various visceral lesions have been found complicating the special eruption under consideration, such as syphilis, tuberculosis, syringomyelia, and nephritis.

**Symptomatology.**—The eruption is characterised by the evolution of superficial pustules, varying in size from a pin's head to a hemp seed or rarely a lentil. They are apt to form in little groups, to which others are added, and appear to be seated on reddened, somewhat swollen taches.

It is said that the erythematous taches may precede the pustules. Another feature is the marked tendency of these patches to extend eccentrically, developing fresh pustules on the spreading part and on the borders in a single, double, or triple circle. The pustules rapidly dry up into thin crusts, which leave on their fall a red, infiltrated, or pigmented surface. These patches may join others in their spread, and large tracts of skin with more or less evidence of circination may be formed. These areas may ooze and simulate weeping eczema. As with other bullous and pemphigoid eruptions, there may be some vegetation, but this is exceptional and but little pronounced. The discharge emits a fetid odour. Itching and burning is often present in variable intensity.

The eruption commences generally in the folds of the groin, breasts, axillae, and later may involve many parts. In some cases the tongue, palate, vault of the mouth, and the pharynx are attacked, and in one case necropsy disclosed lesions in the oesophagus. The mouth lesions are said to be inconstant, and not very abundant or painful.

A continuous remittent fever is present, and the eruption continues with successive outbreaks announced by rising temperature and shivering. A parched tongue, vomiting, and some delirium may be present. The eruption, as originally described, commenced at various periods in the course of pregnancy, and did not cease before the termination of pregnancy, which was generally premature. Death often ensued after delivery, or the patient might recover, but die during another pregnancy.

**Prognosis.**—This is always grave in any attack, and there is a strong tendency to recurrence from successive pregnancies or other causes. The accouchement is generally premature, but even when it occurs at term the child often dies in a few days. In one case the infant presented an eruption suggesting the mother's disease. Out of Kaposi's 12 cases in women nine died in the first attack and three in later outbreaks; but by the addition of other cases Dubreuilh gives eighteen deaths in 24 cases, and Borzecke nineteen in 34.

**Diagnosis.**—The characteristic features of the eruption are: the evolution of small, superficial, grouped pustules on an inflamed base with a marked tendency to eccentric spread with the formation of pustules in one or more concentric circles at the periphery; the association with more or less disordered sensations of itching and burning; the continuation of the eruption in successive outbreaks with fever; the persistence of the pustular type throughout; a grave state of the general health, terminating in death in some attack in a large proportion of cases; and a predilection for the lower abdomen and neighbouring parts of the groins and thighs. Except for the gravity of the disease there is but little fundamental difference between it and the pustular cases of dermatitis herpetiformis, which may change, however, into another type of eruption. The reader is referred to the plates illustrating Fordyce's case. If we contrast it with hydroa gestationis, there is little distinction except for the gravity and rarity of the pustules in the latter; but this is no reason why there should not be a pustular hydroa gestationis as well

as a similar phase in the forms of dermatitis herpetiformis unassociated with pregnancy.

**Treatment.**—Attempts to arrest the malady are apparently futile, but the removal of the child has been advocated. Our efforts must be directed to maintaining the general strength by arsenic, quinine, and tonics. It is important also to keep the skin disinfected as far as possible by continuous or other baths, and to calm the inflammation, and soothe the itching and burning, by one of the numerous occlusive dressings, such as zinc creams, powdered over when the cream has dried as far as possible.

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## EPIDERMOLYSIS BULLOSA

Synonyms.—*Acantholysis bullosa* (Goldscheider); *Congenital traumatic bullous Disease resembling Pemphigus* (Payne); *Epidermolysis bullosa hereditaria*; *Hereditary bullous dermatitis* (Valentin); *Chronic hereditary bullous Dermatitis* (Bowen).

By T. Colcott Fox, M.B., F.R.C.P.

**History.**—In 1882 Goldscheider and J. F. Payne independently published descriptions, and in the same year I exhibited a mother and her son with the affection at the Dermatological Society of London. In 1883 Dr. Wickham Legg recorded two cases, and since then the literature has become voluminous.

**Etiology.**—The affection differs from all other bullous eruptions in that its leading feature is the congenital, or perhaps rarely acquired, vulnerability of the skin, whatever its exact nature may be, so that all sorts of external injuries excite bullae, but the latter probably never occur without trauma. As is well known, persons with soft hands, unused to manual labour, may get bullae from trauma, for instance, experienced in rowing; but in the affection under consideration the vulnerability is greatly exaggerated, though no doubt varying in intensity in different cases. A second feature is that, although single cases may occur, in a large proportion of instances several or many members of a

family in one or different generations may be similarly affected. Remarkable illustrations of this tendency have been published, such as that by Bonajuti, in which 31 persons (16 males and 15 females) were affected out of 63 in five generations. Valentin gives 11 cases (9 males) in four generations, and no healthy females transmitted the tendency. Blumer noted its occurrence in four consecutive generations, 11 out of 24 males and 5 out of 12 females, and Dr. Cane obtained a definite history of blisters, evolving more or less throughout life in 6 persons, representing four generations in direct descent. Colombini, out of 47 in three generations, traced 24 affected (18 males and 6 females). The tendency to the formation of bullae usually persists throughout life, but in some cases it gradually ceases. The course is non-febrile, and the general health is unaffected.

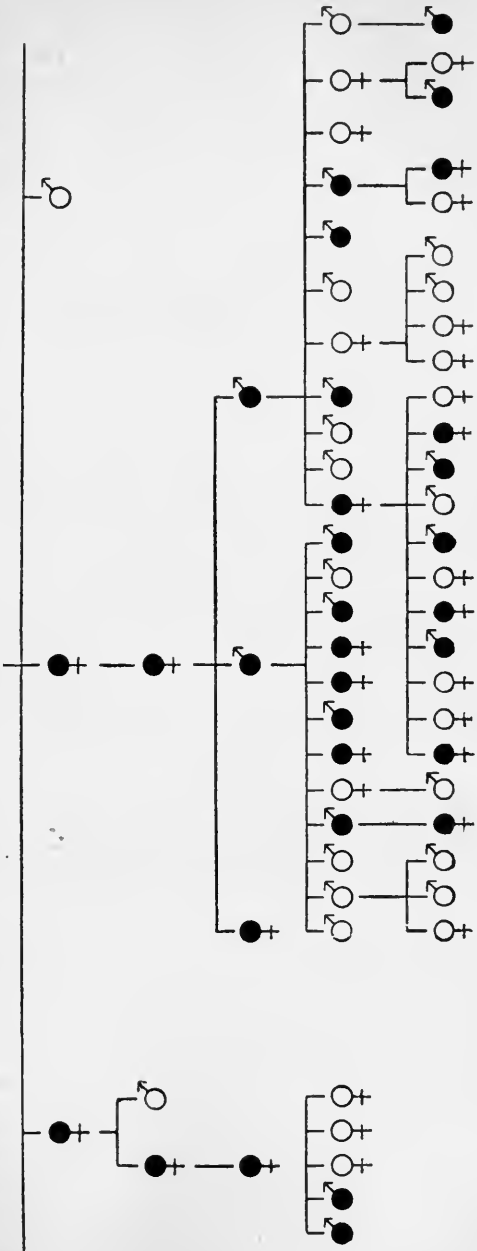

FIG. 98.—Pedigree of epidermolysis bullosa (Bonajuti) from Paper by Dr. Gossage.

**Morbid Anatomy and Pathogeny.**—The site of the bullae varies. Bonajuti and Colombini found it under the corneous layer; Mrs. Savill, under the strata granulosum and lucidum; Elliot and also Engman and Mook in the deepest part of the rete; but, according to most writers, it is formed by a separation of the whole epidermis from the corium. Into the cavity the papillae may be seen projecting from

the corium. The contents vary somewhat with the stage of existence. When young, there is some granular debris and free normal or partly degenerated epithelial cells, but no fibrin or leucocytes; later, threads of fibrin form, and some polymorphonuclear leucocytes are present. The bullae are sterile at first, but subsequently may contain some staphylococci and some red blood-corpuscles. Eosinophilia is not marked; Railliet found 5 per cent and Colombini 8 to 10 per cent in the blood, and 10 to 14 per cent in the bullae, but the percentages were much lower in other cases. Schmidt found 2 to 3 per cent in the blood, and Bettmann a low percentage. The formation of the bullae is obviously caused by the rapid exudation of serum. But by what process is this brought about, and to what is the peculiar vulnerability due? It does not appear to be an inflammation, for there is little evidence of this in the cutis, as a rule, and Elliot found no trace of vacuolation in the epidermic cells seen in chicken-pox and eczema. It in some ways recalls extreme forms of bullous urticaria, formerly attributed to an unstable vasomotor system; but these are very rare in dermographism, and other urticarial lesions are not met with in epidermolysis, except as a stage in some experimentally produced bullae. Bukovský considered that the process is due to some physical defect, and that it is not caused by anatomical changes. Diminution of resistance of the spiny layer (acantholysis) has been suggested, as has also the state of the vessels of the dermis. Valentin held that there was a weakness in the walls of the papillary vessels, and Blumer described defective formation and an embryonic condition of the walls of the blood-vessels of the dermis. Elliot excised skin from areas which objectively were entirely normal in order to search for any histological state which would explain the easy and ready production of bullae, but it should be mentioned that the patient had suffered from epidermolysis for twenty-three years. He found throughout every section, no matter from what part of the body it was obtained, degenerative changes of the nuclei and protoplasm in 1 or 2 rows of cells just above the basal stratum of the rete, and particularly in the interpapillary prolongations and in the basal stratum. This degeneration might lead to complete destruction of cells. In sections of an artificially produced bulla this degeneration was more or less obscured by oedema. In places the basal layer of the rete had apparently disappeared, leaving a cavity. Schmidt also found degeneration of the basal epithelial cells. There were no appreciable changes in the corium except that the vessels in the papillary and sub-papillary layers were hyperplastic, with thickened coats and fully-developed connective-tissue cells around them. Schmidt's results were somewhat similar. Engman and Mook excised healthy-looking skin, apparently in the neighbourhood of a bulla, and summed up their results thus: they did not find Elliot's degeneration but "oedema of the epidermis, succulent horny layer, normal granular layer; colliquation in many cells of the basal layers of the epidermis, dilatation of the intercellular channels. No vesiculation or marked degeneration of the

epidermis, and only changes which could be ascribed to oedema; oedema of the cutis; dilatation of the lymphatic channels and vessels, most marked in the upper portion, papillary pegs therefore swollen; slight increase of cells about the vessels; absence of elastic tissue in the papillary and sub-papillary regions of the dermis, and sparsely distributed and deformed in the deeper regions." On the other hand, Colombini found the elastic tissue normal, but Mrs. Savill noted it as slightly atrophied. Engman and Mook, in a later research on two comparatively slight cases, found indications of the same changes in the elastic elements, but very much less marked. Stanislowsky also described a chronic periarteritis and periphlebitis with loss of elastic tissue.

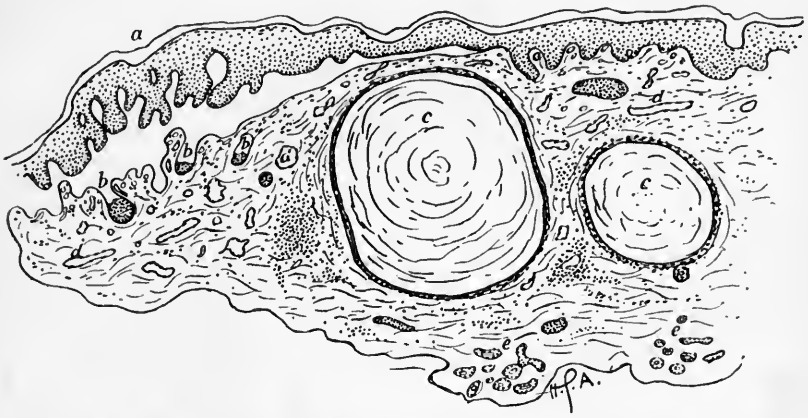


FIG. 99.—Diagrammatic drawing of the microscopical appearances of a section of the skin in epidermolysis bullosa. (*a*) Detachment of the epidermis to form a bulla, leaving behind some tags of epithelium (*b*); (*c*) Epidermic cysts, possibly formed from included tags of epidermis, but regarded by some as cystic dilatations of sweat ducts. (*d*) Dilated lymphatics. (*e*) Sweat glands. (H. G. Adamson.)

A word may be added about a secondary feature, namely, the milium-like cysts. Dr. Adamson's results, in a biopsy from a well-known London case, agree with those of others. The cysts, situated just below the epidermis, consisted of an epithelial layer surrounding a mass of concentrically-arranged horny cells, which he considered were probably formed from tags of epithelium left behind in the corium and shut off during the healing process. According to Darier, however, they are due to temporary occlusion of sweat ducts by the regenerated epidermis during the repair of the lesion. Bukovský seems to be of Darier's opinion.

**Symptomatology.**—This somewhat rare eruption is characterised by the formation of bullae of various sizes and their secondary effects; and has, in contrast to pemphigus, the distinctive feature that all the bullae form in response to various forms of trauma, and probably never arise spontaneously, although such an occurrence has been recorded. This feature, and the fact that the superficial layers of the skin can become detached by trauma far more easily than in the normal integument, point

to the existence of a special vulnerability of the skin of various grades, most frequently congenital, which is the fundamental factor. There seems also to be some factor in the summer months, probably congestion, which sometimes increases the vulnerability; at any rate several authors have reported an increasing tendency to the formation of bullae in summer, and hyperidrosis, local or sometimes more generalised, has been noted. The bullae generally have clear contents at first with an alkaline reaction, and not infrequently are sanguineous. They may become puriform and acquire a red halo. Bonajuti observed a preliminary stage of congestion. Secondary changes depend largely on the character of the contents of the bullae, and their successive formation in a particular area. The elementary lesions may disappear without prolonged trace, or scaling or crusting areas may be produced, or excoriations, and even ulceration and scarring, and simple atrophy may be left. Another secondary result is the occasional formation of little horny, milium-like cysts, which may sometimes be seen in other bullous and vesicular eruptions. Hallopeau drew a distinction between simple cases and others with complications, but there does not seem to be any fundamental difference. Another result in old-standing cases is a more or less localised or generalised atrophy of the skin, which is not so easily to explain.

FIG. 100.—Epidermolysis bullosa of life-long duration in a woman. Shews a characteristic haemorrhagic bulla of traumatic origin and widespread atrophy of the skin which gradually came on.

The sites of predilection are those most exposed to trauma, such as the hands or feet; but it must be borne in mind that pressure on the buttocks, leaning on the elbows, and the compression of corsets and garters may excite bullae, and therefore the sites affected will largely depend on the sex and the surroundings in which the patients are placed. Any site may be involved. A striking feature in many of these cases is the formation of bullae around or under the nails, thus causing various forms of dystrophy or temporary or permanent loss of some or many nails (*vide* Fig. 164). The mucous membranes may be affected, and vomiting and haematemesis have been observed, and oesophageal casts have been brought up (Köbner). The teeth may suffer from such lesions. As a rule there is little itching, but, of course, there may be pain from excoriations and other causes. The general health is rarely disturbed.

Some authors have described a xerodermia or ichthyosis, and in one case webbed fingers.

*Onset.*—The lesions have been observed at birth, and frequently start a few days later, or in early infancy. In some cases the onset seems to be delayed to later years, or, at any rate, is not noticed. In this connexion I may refer to a remarkable case of my own: a woman in adult life had a first attack of a profuse bullous eruption, apparently true pemphigus, and later gradually became the subject of a typical epidermolysis. The duration is indefinite; it may be lifelong. In a case recorded by Colombini the affection became milder in middle life and disappeared in old age; Bonajuti observed a similar occurrence.

**Prognosis.**—The vulnerability of the skin is a nuisance, but in some cases it seems to lessen and even to disappear in later life. The general health is practically unaffected.

**Diagnosis.**—It is evident that epidermolysis may be confounded for a time with other bullous eruptions, but the course of the affection, and the experience gained that the bullae only evolve in response to trauma, will decide the matter, especially if a history of its existence from early infancy and in the family can be obtained. The dystrophy or loss of the nails, so frequently present in old-standing cases, is very suggestive. Most difficulty arises in early infancy, where we have to remember the bullous syphilide of the palms and soles of new-born infants, and the not infrequent occurrence of streptococcic blisters. The affection has in some cases first attracted attention by the blistering of a soldier's foot in marching, and such a case will require very careful inquiry to establish a firm diagnosis. Radcliffe Crocker placed epidermolysis with pemphigus, because in the latter bullae may sometimes be excited by trauma, and the sliding off of the skin (Nikolsky's sign) is also observed. Cases with bullae in association with ichthyosis are also described. It may be a familial disease, and the skin may be acantholytic.

**Treatment** is only palliative. Obviously the special vulnerability of the skin cannot be corrected, but the patient must, as far as possible, avoid trauma. With regard to the forms of special treatment for which benefit has been claimed, it must always be borne in mind that when patients improve, for instance, while resident in a hospital, a particular drug administered at the time is apt to earn a false reputation. Secondary pyogenetic processes in the skin should be avoided by cleanliness and proper dressings.

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## TUBERCULOSIS OF THE SKIN

By J. H. SEQUEIRA, M.D., F.R.C.P.

THE discovery of the tubercle bacillus and its demonstration in the lesions of lupus vulgaris mark an important epoch in the history of tuberculous diseases of the skin; and in recent years the perfection of histological methods and the advances of bacteriology have increased to a remarkable degree our knowledge of the numerous conditions which depend directly or indirectly upon the bacillus of Koch. In certain directions much remains to be done to define the part played by the organism and the influence of the toxic bodies produced by it, and we are obliged, at any rate for the present, to divide the tuberculous diseases of the integument in a somewhat arbitrary manner into two classes—the tuberculous affections and the tuberculides.

The criterions upon which a cutaneous affection is deemed to be tuberculous are (i) the presence of the tubercle bacillus in the lesions;

(ii) the development of tuberculosis in a guinea-pig inoculated with portions of the diseased tissue, and (iii) a local reaction following the injection of Koch's old tuberculin. These conditions obtain in lupus vulgaris, miliary tuberculosis of the skin, tuberculous ulcer, tuberculosis verrucosa, and scrofulodermia. They are therefore classed as "tuberculous diseases of the skin."

But there are other conditions in which the bacillus of Koch is found exceedingly rarely or not at all, and positive results are seldom obtained after the inoculation of a guinea-pig, in which injections of tuberculin give a general and sometimes a local reaction; and the histology of the lesions, the clinical history, and the association of tuberculosis in other organs form such a mass of evidence that it is difficult to escape the conclusion that the lesions must be produced by the bacillus tuberculosis directly or indirectly. To this group of diseases the name "tuberculide" is given. In both directions it is hard to define, for some undoubted tuberculides approach very closely to the tuberculous lesions; and in the other direction it is difficult to say upon how little evidence the name tuberculide is to be applied.

The undoubted tuberculides are (i) lichen scrofulosorum, (ii) a group of papular and nodular necrotic conditions (folliclis, etc.), and (iii) erythema induratum of Bazin. There is some doubt about the sarcoids of Boeck, and about lupus erythematosus. Pityriasis rubra and some of the chilblain and allied conditions are included by certain authors.

LUPUS VULGARIS.— **Definition.** — The name "lupus," in modern nomenclature, is applied to a new growth or granuloma of tuberculous origin, invading the skin and adjacent mucous membrane. It begins in nearly all cases in childhood and adolescence, shews a preference for the exposed parts of the surface, spreads by continuity and by multiplication of foci, rarely infects the lymphatic glands, and destroys the tissues attacked, either by ulceration or by cicatricial transformation without breach of surface.

**Etiology.**—In over 80 per cent of my cases the first manifestation appeared during the first two decades of life, and in 53 per cent before the tenth year. In 9 per cent the onset was in the third decade, and in 11 per cent later. Exceptionally the disease may begin in advanced life. Of 1000 patients suffering from lupus seen at the London Hospital, 707 were females and 293 males. It is difficult to explain this difference. It has been suggested that the girl being more in the house than the boy is more likely to be infected by organisms in dust and the like. It is also possible that the integument of the female is less resistant than that of the male. Though not confined to the poorer classes, lupus is much more common in children who are ill-fed and live in bad hygienic conditions than in those whose surroundings are good. It is often associated with inherited or acquired debility of constitution, and with a history of tuberculosis in the family; in my clinic it is present in about 40 per cent. The sufferer from lupus is

liable to other tuberculous affections; for example, of the glands, bones, and joints. Pulmonary tuberculosis does not predispose to the cutaneous affection, but phthisis is responsible for a number of fatalities in patients suffering from lupus. This form of tuberculosis of the skin does not appear to be hereditary as such, and in 1000 cases I have only met with four instances in which two members of the same family were attacked. Twice mother and child were affected, and I have had two brothers and two sisters under my care. A. Olivier has, however, recorded 4 cases in a family of five.

Lupus is more common in Northern than in Southern Europe. It is comparatively rare in the Colonies and in America, and in tropical and sub-tropical regions.

The immediate cause can seldom be determined. Direct inoculation is probably common, and, occasionally, can be traced with certainty. A case in which lupus appeared in a tattoo-mark is reported by Jadassohn, the infective element being the saliva of a phthisical operator (36). Infection by tuberculous sputa has also been recorded by Corlett. Similar local outbreaks have been known to follow vaccination. Dr. Graham Little collected a number of cases. I have seen four instances, all cases of arm-to-arm vaccination, but it is doubtful whether the disease was inoculated with the lymph, or whether the microbes gained access before the vaccinal lesions were healed, or attacked them as points of least resistance. Perforation of the lobule of the ear has also been followed by lupus (Schiele), and O. Bruns collected 4 cases following injections with the morphine syringe. It is very probable that the lesions of common impetigo afford points of entry for the infecting organism. The frequency with which lupus vulgaris starts in the inferior meatus of the nose is explained by the inhalation of dust, or more probably, by contact with fingers infected with the bacillus tuberculosis.

Sinuses leading to tuberculous glands and caseating foci in bones are commonly associated with scrofulodermia, but true lupus with characteristic nodules is not an uncommon sequel. Dr. Emlyn Jones found this association in over 11 per cent of the cases seen at the London Hospital.

An eruption of disseminated lupus may follow an acute specific fever. I have histories of its occurrence after measles and whooping-cough. Tobler, du Castel, and Adamson, have recorded measles, and Philippson, and Besnier (7) scarlet fever, as predisposing to this form of lupus. Dr. Adamson suggests that the exanthem may cause the breaking down of an old tuberculous focus, and the dissemination of the bacilli by the blood stream (compare p. 481).

**Pathology.**—Lupus is essentially a granulomatous neoplasm, due to the presence of the tubercle bacillus. On section of the growth it is found to consist of round nucleated cells of various sizes, lying in the meshes of a delicate reticulum; giant cells may sometimes be seen, and Unna lays stress on the presence of plasma cells. Tubercle bacilli are present, although in such scanty numbers that they may be very hard to detect. The centre of

the lupus nodule tends to perish by fatty degeneration without caseation, while at the margin and base new fibrous tissue is formed at the expense of the irritated structures of the dermic bed. The glands of the skin are destroyed, but may first be obstructed, and so appear for a time as small miliary bodies in the diseased area; eventually, however, the place of all the normal structures of the corium is taken by cell-growth or cicatrix. The epidermis is at first unaffected, and may remain so throughout, but usually it becomes involved sooner or later, the cells of the rete degenerating over the nodules while the papillae atrophy; at the margins, however, there may be some epidermic thickening with papillary hypertrophy, which in histological sections may give rise to appearances very like those of squamous-celled carcinoma. The injection of Koch's old tuberculin is followed by a local reaction in the lupus tissue, and Senger has obtained similar results, with elimination of the nodules, by inunction of a 10 per cent ointment of the old tuberculin. He asserts that this reaction is specific, and may be used for differential diagnosis. Von Pirquet's and Calmette's tests invariably give positive results in cases of lupus vulgaris. Inoculation of guinea-pigs with lupus tissue causes tuberculosis in these animals.

Dr. Stanley Griffith, of the Royal Commission on Tuberculosis, to whom I sent material from a series of cases of lupus, has kindly given me a summary of the results of his cultural and inoculation tests. He was able to obtain cultures in 20 instances. Only three of the 20 cases yielded cultures identical both in cultural characters and virulence with one or other of the two established types of mammalian tubercle bacilli. In one case only were they typically "bovine," and two were typically "human." Of the remaining 17, 8 grew like the bovine organism, and 9 like the human tubercle bacillus, but none of these exhibited the virulence which has been shewn to be characteristic of bacilli with such cultural characters. The eight atypical bovine strains proved to be less virulent for the calf and rabbit, and also for the monkey and the guinea-pig, but by residence in the bodies of calves and rabbits, their virulence became indistinguishable from that of the ordinary bovine organism. The nine atypical human strains also displayed less virulence than the human bacillus, but this virulence was increased by residence in the bodies of monkeys. Dr. Griffith was led to conclude that the viruses in these 17 cases were attenuated. The complete report of Dr. Griffith's researches appears in the Report of the Royal Commission.

**Site.**—Lupus may attack any part of the cutaneous surface, and may invade the mucous membranes by extension from the skin. I agree with Audry that too little attention has been paid to the primary infection of the mucous surfaces, especially of the nose, and the secondary invasion of the skin.

On the skin the seat of election is the face (78 per cent). In the London Hospital clinic, Dr. Emlyn Jones found that the disease started about the nose in 28 per cent, and in other parts of the face, including

the auricles in 48·4 per cent. The lips were primarily involved in 1·8 per cent. The neck was the first part attacked in over 13 per cent, and usually secondary to tuberculous glands. In 8·5 per cent the primary focus was on the trunk or extremities. Lupus seldom arises on the hairy scalp, forehead, or upper eyelids. It is rare on the genitals, in the neighbourhood of the anus, in the armpits, and on the palms and soles. Its distribution is almost always asymmetrical, except in certain cases starting on the nose, when it may spread more or less equally on to each cheek.

*Lesions of mucous membranes* were recognised in 417 out of 964 cases of lupus (43·25 per cent) seen at the London Hospital. In the Finsen Institute at Copenhagen, Christiansen found 80 per cent. In the opinion of the writer, and of other British observers who have had the opportunity of attending the Copenhagen clinic, the type of lupus seen there is of greater severity than that occurring in the British Isles. The nose, nasal duct, lacrymal sac, conjunctiva, mouth, palate, tongue, pharynx, and larynx may be affected. It is impossible to say in what proportion the disease actually started in the mucous membrane. It is common to obtain a history of prolonged nasal catarrh and epiphora before any cutaneous lesion has been observed. Audry, Dubreuilh (23), and Caboche insist on the frequency of a nasal origin of lupus vulgaris.

**Symptoms.**—Lupus may assume a number of phases, often described as varieties. The first appearance is nearly always that of a small tubercle imbedded in the corium and but slightly elevated above the surface. As it grows it becomes more prominent, and assumes a colour varying from pale yellow or yellowish-red to dark reddish-brown, with a translucency not unlike that of apple jelly, but these characters may be masked by thickening and scaling of the epidermis. The characters of the lupus spot or "nodule" are best seen by examination in daylight under the pressure of a piece of glass, such as a glass tongue-depressor. The surrounding hyperaemia is removed by the pressure, and the non-vascular jelly-like spots stand out clearly. The lupus lesion is of soft consistence, painless when untouched, but it may be tender on pinching and on firm pressure. When scraped with a curette it offers small resistance and may be shelled out of its bed, leaving a well-defined excavation with hard fibrous walls and base. The primary focus is generally single, but multiple lesions are not uncommon, and in the latter case the outbreak is usually serial, two or more separate spots seldom appearing simultaneously. I have seen twenty-seven separate lesions scattered widely about the face, body, and limbs, all appearing in the course of a few months (lupus disseminatus). Such cases usually appear after an acute specific fever (*vide* p. 468). The lupus lesion spreads by marginal growth, perhaps coalescing with adjacent areas in case of multiplicity, and in its further extension may assume various appearances. It may form a flat patch (lupus planus) or a distinctly elevated plaque (lupus discoides); or extending by a nodular margin while healing from the centre, it may appear as a segment of a circle or

a complete ring (lupus circinatus). Complex lesions with festooned outlines may be formed when neighbouring rings coalesce; or again, the disease may creep for long distances, leaving a serpentine tract of cicatrisation behind it.

The nodule, ring, or patch may progress without breach of surface, leaving cicatricial transformation in its trail (lupus non-exedens), or it may break down into ulceration (lupus exedens). In lupus non-exedens spontaneous healing of part of the area is common, and this leads to the formation of the circinate and crescentic figures described above. In rare cases complete spontaneous resolution may occur, perhaps most frequently in the form attacking the cheeks which Leloir and Vidal (44) have called "Lupus érythémateux tuberculeux." It closely resembles lupus erythematosus, and some authors have suggested that it is a combination of the two diseases. It is in reality a superficial variety of lupus vulgaris, in which the nodules are very small and only demonstrable with the microscope. Dubreuilh's "Lupus tuberculeux superficiel de la face" (24) is a closely allied form, but here the minute "nodules" are visible under a lens at the margin of the patch. Excessive scaling of a patch of dry lupus may simulate psoriasis, and warty excrescences are not uncommon. On the other hand, lupus non-exedens may become ulcerated, and mixed cases in which dry and ulcerating lesions coexist occur frequently.

In lupus exedens the eruption may be ulcerative from the beginning, or the ulcerative character may be secondary. There is comparatively rapid extension and often grave destruction. Such lesions are most frequent about the natural orifices, particularly the nares. They may take a pustular, vegetative, or serpiginous form. The lupus ulcer, nearly always seen in the more feeble subjects, varies in depth and character. Its growing margin may be more or less raised, and may preserve the original semi-translucency of the nodules, or it may be roughened and dulled by epidermic desquamation, and thickened, or rendered warty, by papillomatous hypertrophy. Its base is usually indolent, but when irritated it may become incrusted with scabs or beset with exuberant granulations (lupus vegetans). If the area of ulceration is small and includes a number of isolated tubercles it may simulate impetigo, or, if a little larger, rupia. When it attacks the hair follicles it may resemble acne or sycosis according to its position. Permanent scars are left in all cases. The lupus ulcer is seldom deep, and does not implicate bones and muscles, but on the nose and pinna it often destroys the cartilages, and in the fingers is apt to produce great deformity (lupus mutilans). With the last condition tuberculous teno-synovitis is often present. In rare instances the ulcerative process is almost phagaedenic in type (lupus vorax *vel* phagedaenicus).

On a limb lupus may be associated with lymphangitis and lead to much enlargement of the member, amounting even to a pseudo-elephantiasis. On the lips, too, it induces considerable thickening from the coincident invasion of both the cutaneous and mucous

surfaces, and from recurrent attacks of inflammation due to pyogenetic infection.

Vascularisation of lupus lesions has been described by Besnier (8) under the name "Lupus angiomateux," and by Majocchi as "Lupus telangiectodes disseminatus." Congestive lupus of the end of the nose, often associated with grave intra-nasal disease, is described by Brocq.

The cicatrix of lupus, if unirritated by local treatment, is generally thin, white, and fairly smooth. Often, however, it is unsound and prone to break down into fresh ulcers, or to undergo cheloid change, especially after treatment by erasion.

All the forms of lupus described are different manifestations of one disease, the variations being dependent upon varying local and general conditions, and possibly, upon the virulence of the infecting organism, and upon the presence of other microbes, particularly pyogenetic cocci.

Lupus may coexist with syphilis, usually inherited, and may then form a hybrid of a perplexing and usually very destructive kind.

*Lupus of the Mucous Membranes.*—The disease commonly starts in the inferior meatus of the nose. From the nose lupus may spread, via the nasal duct, to the lacrymal sac, and, rarely, to the conjunctiva. It may pass backward to the pharynx, or through the anterior palatine canal to the front of the hard palate. The soft palate, gums, and buccal mucosa may be affected, and also the pharynx, larynx, and tongue. I have seen the conjunctiva diseased by extension from the skin, and adhesions between the conjunctiva of the lower lid and that of the eyeball. In a large number of cases several mucous membranes are attacked at the same time. In the 417 cases seen at the London Hospital the seat of infection was as follows: nasal mucous membrane 379; lips 133; buccal mucosa and gums 51; palate 44; larynx 10; tongue 4. Cases were seen in which the middle ear became affected; these were reported on by my colleague Mr. Hunter Tod. Godenigo has made similar observations.

Lupus of the mucous membranes appears as a pink, slightly elevated patch with a granular surface, often studded with small ulcers, or the whole surface may be ulcerated and covered with crusts, especially in the nose, where Simonin has also found pseudo-polypoid conditions. The gums are swollen and red, and ulceration may expose and loosen the teeth. On the tongue the lesion may be papillomatous or ulcerating. Lupus of the external genitals has been described, but I have not seen a case. The histology of lupus of the larynx has been studied by Leredde, and of the tongue by Darier (22).

**Course.**—The progress of lupus vulgaris, although varying greatly in rapidity in different cases, is essentially chronic; yet the infection of the lupus ulcer by the common pyogenetic organisms may lead to a relatively rapid destruction. The disease usually lasts for an indefinite number of years. Cases of ten or twenty years' duration are not uncommon, and I have once seen a patient who had had lupus for sixty years. Recurrences after apparent cure are frequent. The health of the patient is generally feeble, especially in the ulcerative and multiple forms, and there is a

liability to the incursion of other tuberculous affections. In many subjects, however, the local ravages are compatible with a fair amount of physical vigour. I know several patients who are married and have healthy families.

The ulcerating and, to a less extent, the dry forms cause grave deformity ; for example, destruction of the nose, perforation of the nasal septum, atresia of the nostrils (in one of my cases complete), ectropion of the lower eyelids, contraction of the buccal orifice, and mutilation of the auricles and of the extremities.

**Complications.**—Erysipelas is a not uncommon complication of lupus exedens. The attacks may have a beneficial and sometimes even permanently curative effect (Hallopeau (32)). Five years ago a male patient suffering from lupus was sent to me for the Finsen treatment. Before the first sitting could be arranged the patient had a very severe attack of erysipelas, with high fever and semi-coma. On the return of convalescence the lupus had entirely disappeared and the patient is still quite free.

Visceral tuberculosis may lead to a fatal issue. Forchammer states that of 1190 cases of lupus treated at Copenhagen in ten years, 143 died, and of these death was due to tuberculous disease in 81. No fewer than 58 fatalities were caused by pulmonary tuberculosis, but in only 8 of these cases was the lung affection primary. He points out that 40 out of the remaining 50 patients had lupus of mucous membranes, and his experience that lupus vulgaris seldom occurs in the course of pulmonary tuberculosis, though the latter disease is a not infrequent cause of death in lupus patients, is in accord with my own observations at the London Hospital. As already mentioned, the type of lupus seen in London is less severe than that at Finsen's Institute, and I have records of only 7 fatal cases of pulmonary tuberculosis, and 2 of miliary tuberculosis, the fatal issue being due to meningitis. I have several times noticed that the cutaneous lesion entirely disappeared in rapidly fatal pulmonary tuberculosis.

Bone and joint tuberculosis are frequently seen in association with lupus vulgaris. I have cases of Pott's disease, morbus coxae, tuberculous dactylitis, and tuberculous ocular affections attending my clinic for lupus vulgaris.

Squamous-celled carcinoma occurred in 14 out of nearly 1000 cases seen at the London Hospital. As cases varying in duration from a few months are included this proportion is too low, for carcinoma rarely develops in lupus of less than twenty years' duration. Some observers give the proportion of lupus carcinoma as 2 and others as 4 per cent. It is remarkable that male sufferers from lupus are five times as liable to carcinoma as females. Ten of my 14 cases were males. In Ashihara's 122 collected cases the same proportion is found. I attribute the disproportion to local irritation, as most of my male patients were engaged in occupations attended with exposure. In 2 cases at least *x*-ray treatment in excess (in one case about 1000, and in another 300 exposures) appeared to me to play an important part. Norman Walker, da Costa,

and others have reported similar cases. Squamous-celled carcinoma occurs on the cicatrix, and in chronic cases of "red" lupus. It occurs in two forms, nodular and ulcerative. The latter is the more destructive and the more rapidly fatal.

**Diagnosis.**—Lupus vulgaris must be distinguished from some other forms of tuberculosis of the skin, from lupus erythematosus, and from granulomas caused by the *Treponema pallidum* and other organisms.

*Scrofulodermia* may appear in the same class of subject and even in the same individual. The lesions are associated with caseating glands and tuberculous foci in the bones and joints. They are tumour formations from the outset, and when ulcerated the edge of the lesion is undermined. The apple-jelly nodules are absent.

*Acute tuberculous ulcers* occur about the orifices of the body in connexion with visceral tuberculosis (*vide* p. 481). The ulcers are superficial, and have an undermined edge. The pus contains Koch's bacilli, often in large numbers.

The *warty form of tuberculosis* resulting from direct inoculation is usually seen on the hand. In advanced cases there is a central scar, surrounded by a warty margin, and outside this a red or livid halo. The lymphatic glands are involved early. A biopsy may be necessary to make the diagnosis.

*Lupus erythematosus* may usually be distinguished with ease by the symmetry of the lesions on the cheeks and auricles, by the absence of nodules, and by the age at which the disease starts. The variety of lupus vulgaris, lupus érythémateux tuberculeux (Leloir and Vidal) may not be distinguishable without a biopsy. Senger states that the local inunction of the tuberculin ointment does not give a reaction in lupus erythematosus. Spitzer and others have described cases in which both lupus erythematosus and lupus vulgaris have coexisted.

*Tertiary syphilis* especially of the nodular and ulcerative forms may closely resemble lupus. The evolution of the lesions and their duration are important factors in the diagnosis. With rare exception, lupus takes years to produce a destruction which syphilis may cause in a few weeks or several months. The gummatous lesions do not shew the apple-jelly like nodules under glass pressure, and when they break down the ulcers have a punched-out character. Where the nose or palate is affected necrosis of bone points at once to syphilis; lupus does not destroy osseous tissue. I have found Wassermann's test very useful in the differential diagnosis of difficult cases. Inoculation of the old tuberculin, or one of the new tests for tuberculosis, may also give valuable assistance. In any case of doubt, and certainly where the lesions appear to be unusually destructive, no time should be lost in trying the effect of mercury and iodides or "606" (see also p. 514).

*Leprosy.*—The nodules of lepra are more elevated than the lesions of lupus, they have a dull brownish or earthy colour, and are opaque. There is often coexistent anaesthesia, and thickening of the ulnar nerve. The excision of a doubtful nodule, and examination of stained sections

will shew large numbers of Hansen's bacillus, in great contrast to the sparsity of the bacillus of Koch.

In *blastomycosis*, *actinomycosis*, and *sporotrichosis* the respective organisms are found in the pus from the lesions. The multiple benign sarcoid of Boeck (lupoïde miliaire disséminée) is distinguished by the symmetrical arrangement of the lesions on the face, shoulders, and extensor surfaces of the extremities. The individual lesions are small nodules, rarely plaques. The histology does not shew the characteristic structure of lupus and inoculations of guinea-pigs give negative results.

*Sycosis lupoides* affects the beard and moustache regions. Like lupus, it is of long duration, but the central scar is surrounded by suppurating hair follicles, and there are no apple-jelly nodules (*vide* p. 190).

*Impetigo* and *psoriasis* should not be mistaken for lupus. The duration of the tuberculous disease, and its tendency to cicatrisation should obviate error.

**Treatment.**—It would be impossible to detail all the methods which have been advocated for the cure of lupus, and only those which have stood the test of experience will be described. There are three points to be kept in view: (1) to increase the resistance of the patient to the invading organism; (2) to destroy or remove the bacilli; and (3) to remove or destroy the lesion produced by the microbic invasion with as little damage as possible.

The resistance of the patient may be improved by good feeding, especially administering fatty foods, good milk, cream, cod-liver oil, etc.; by attention to the general hygiene, fresh air, and if possible residence where an open-air life can be lived, and by tonics such as iron and arsenic. *Thyroid extract* has been found useful in a small number of cases (Byrom Bramwell), but it is not to be recommended, as it sometimes has an injurious effect on the general health.

Great attention has recently been paid to the improvement of the patient's resistance by the use of *tuberculin*. After Koch's discovery, a large number of cases of lupus vulgaris were treated in many clinics by the old tuberculin with a few good and some disastrous results, and the method fell into disrepute, though McCall Anderson in 1905 strongly advocated its more general use. Sir A. E. Wright's observations shewed how the dangerous results which sometimes followed the use of tuberculin could be obviated by the observation of the opsonic index, and a large number of cases have been treated on the lines he recommends. Drs. Bulloch and Western have treated a large number of patients attending my clinic at the London Hospital, with occasionally gratifying results, but Reyn and Kjer-Petersen's experience at Copenhagen is not at all favourable, and I agree with them that the majority of cases of lupus vulgaris are little, if at all, benefited by the opsonic treatment. The best results have been seen in some of the ulcerative cases, and especially in the scrofulodermias. Some good results have followed the treatment of mucous membrane lupus, but relapses have followed its withdrawal. A new use for tuberculin in the cure of lupus is that advocated by Senger.

The lesions are rubbed with an ointment containing 10 per cent of the old tuberculin. A local reaction occurs with elimination of the nodules through necrosis. This measure is at present only in the experimental stage.

The inoculation of lupus with streptococcic toxins has not met with the success that justifies the exposure of the patient to the possible risks of the experiment, although beneficial and even curative results have been observed in a few cases of accidental infection. (Cases are recorded by Hallopeau (32), and by Ciarocchio.)

*Local treatment* offers better chances of cure. The aim of local treatment in lupus is the destruction or removal of the infecting organism and its products. Bactericidal applications, caustics, the cautery, erasion, scarification, excision, and phototherapy and radiotherapy are all used with these objects.

Chemical caustics, such as the strong mineral acids, caustic potash, and chloride of zinc are rarely used now on account of their indiscriminate action, and the ugly scars which are left. Plasters of creosote and salicylic acid I have found of great value in the treatment of extensive lesions, especially upon the limbs. The strongest plaster (Beiersdorf, No. 81, containing 50 grams of each to $\frac{1}{5}$ square metre) is applied for forty-eight hours at a time. After several applications the less resistant lupoid spots are destroyed, leaving small ulcers which often heal up satisfactorily. This treatment may be combined with radiotherapy and phototherapy with advantage. Pyrogallic acid, introduced by Schwimmer, is another caustic which is useful in warty lesions. An ointment containing 40 grains each of pyrogallic acid, salicylic acid, and ichthyol is often used as a preliminary to treatment by light. Parachlor-phenol crystals melted by a heat of 40° C. are recommended by Elsenberg, and local injections of corrosive sublimate by Doutrelepont.

The *actual cautery* is, perhaps, the oldest of the destructive agents, and still preserves a high place in the estimation of many dermatologists. It is always accessible, and very manageable, but it has the disadvantage of being indiscriminate and causes an ugly scar. The most convenient means of applying heat is the galvanic cautery.

*Erasion* has many advocates and the immediate results are often remarkably good. The curette should be applied boldly, clearing away every particle of tissue that will yield to its edge, and the walls of the resulting gap may profitably be treated further by salicylic acid or phenol to reach the organism protected from the curette, and to seal lymphatic spaces which may be opened up. The process is too painful to be borne without an anaesthetic, and gives rise to free bleeding. In some warty and fungating lesions erasion is a useful preliminary to other measures, such as the application of the *x*-rays.

*Multiple scarification* consists in a mincing of the lupus tissue, and depends for its success upon the reparative and reactive processes it sets up in the structures attacked. It is effected by a minute cross-hatching of the cell growth with a sharp scalpel, or a special many-

bladed knife, carried down to the fibrous tissue. Like erasion it is a very painful process, and can seldom be practised to any useful extent without an anaesthetic. It is of most value in the superficial erythematous form of lupus non-exedens, and its effects may be increased by the application of a 5 per cent solution of carbolic acid immediately after the operation. But although sometimes successful it cannot be regarded as a very trustworthy expedient. It has even been accused of inducing secondary tuberculous infection by setting free particles of diseased tissue into the vessels (Besnier), but the experience of other observers does not confirm this charge.

*Excision* has been adopted by many surgeons, and for the treatment of small areas of lupus on the extremities and trunk where the scar is of little moment, it is to be preferred to other measures on account of the rapidity with which the disease is removed. Even in the case of the face and exposed parts, if the lesion is of small dimensions, excision with immediate suture gives good cosmetic results, provided that primary union can be obtained. The results of 240 cases are discussed by Spitzer and Jungmann in an appendix to Lang's admirable work on the operative treatment of lupus. The incision should always lie an eighth to a quarter of an inch outside the area of lupus tissue, more at the growing edge than elsewhere, and be carried down to such a depth as the infiltration seems to demand—taking care, however, in facial lupus not to go beyond the subcutaneous fat. If the wound cannot be closed by suture, skin-grafts should be applied. The difficulty in most cases appears to be to get under the infected tissues, and I have seen several cases of apparently successful excision with grafting, in which the grafted tissue has become infected from below, and the lesions thus produced are exceedingly difficult to treat. As a rule, they have to be destroyed by the cautery through the skin-graft. Höllander had reported good results in the treatment of lupus by means of hot air. Of this measure I have no experience. High-frequency electricity has been advocated by Strebel and others. I have seen improvement in ulcerated surfaces from its application, but it has little influence on deep-seated nodules.

*Phototherapy* by Finsen's method gives admirable cosmetic results, and is the procedure to be recommended when the lesions are of comparatively small dimensions, and on exposed parts. It has, however, several drawbacks; it is tedious and expensive, and is rarely applicable to the mucous membranes. Ulcerative areas require preliminary treatment before being subjected to the light. Antiseptic fomentations are necessary to remove scabs and crusts, and a few applications of the *x*-rays may be required to cause ulcerative patches to dry up. Pyrogallic and salicylic acids are used to get rid of warty excrescences. The essential features of Finsen's treatment are the concentration of the actinic rays of light from a powerful arc-lamp through a series of rock-crystal lenses on to the lupus area rendered anaemic by pressure. The heat rays are eliminated by passing the light through a column of distilled water, and

by the circulation of a current of cold water through the compression apparatus which is used to render the parts anaemic. The initial cost of the apparatus is considerable, but the expense of the treatment lies in the necessity for the constant attention of a nurse to apply the compressor, and to keep the area under treatment exactly in the focus of the rays. The effect of an hour's application is the production of a blister, which appears in from six to twelve hours after the séance, and which heals in a week to fourteen days. The resulting cicatrix is remarkably

FIG. 101.—Patient with lupus vulgaris before and after treatment by Finsen light. Well eight years later.

smooth and supple, and in some early cases almost imperceptible. Extensive areas of lupus require many months and even years for complete treatment. The best results are obtained in cases of dry lupus which have not been subjected to erasion or other measures leaving fibrous cicatrices. Relapses are not common except in cases with concomitant disease of the mucous membrane. In 600 completed cases treated at the London Hospital, the Finsen treatment proved beneficial in 89·4 per cent. In only 7·8 per cent the treatment proved unsuccessful or appeared to be of less utility than other measures. In 2·8 per cent deaths occurred from intercurrent disease.

Finsen at first believed that the ultra-violet rays directly caused the

destruction of the tubercle bacilli in the skin, but it is now recognised that the inflammatory reaction induced in the tissues is the destructive

After Finsen treatment.

Before Finsen treatment.

FIG. 102.—Lupus vulgaris.

agent. That this is not entirely or even in great part due to congestion I have shewn by the prolonged application of dry and moist heat to lupus areas, and by the use of cupping apparatus in a number of cases with unsuccessful results.

Various modifications of Finsen's original apparatus have been tried,

but with the exception of the Finsen-Reyn lamp they do not penetrate the tissues sufficiently. The Finsen-Reyn apparatus has the great advantage that it can be used in connexion with the ordinary street electric mains served with a continuous current; and with current supplied for power purposes at one penny per unit, the cost for an hour's treatment is about twopence halfpenny. Kromayer's quartz mercury-vapour lamp gives intense reactions with a ten minutes' sitting, and I have had some excellent results with it. Unfortunately, the apparatus is very fragile, and repairs cannot be made in this country. On several occasions the lamp has been broken in transit from Germany, and these accidents, apparently unavoidable, have caused much annoyance and delay. The comparative value of the Finsen-Reyn and Kromayer lamps has been studied by Maar.

*Radiotherapy or the application of the* $x$-rays is of great value in lupus of the ulcerative type, and in some of the mucous membrane lesions. The exposures should always be measured by the Sabouraud pastille. It is best to apply a pastille dose or less at one sitting, and to give applications at intervals of ten days. Ulcerated areas rapidly dry up, leaving a sound cicatrix. Unfortunately the rays have much less effect upon the jelly-like spots of dry lupus, and it is usually necessary to apply them so often or for so long that a dermatitis occurs, which is followed by a thin, often much pigmented, scar upon which multiple telangiectases appear, often after a lapse of some months. The danger of squamous-celled carcinoma occurring upon lupus treated many times by the $x$-rays must be borne in mind (*vide* p. 473).

*Radium* may be used to treat individual nodules, and also some of the mucous membrane lesions. To produce an effect at all comparable with that of the Finsen treatment it is necessary to cause a local inflammation which leaves a rather deep scar, upon which telangiectases may appear.

*Treatment of Lupus of the Mucous Membranes.*—Intra-nasal lupus can be rarely reached with Finsen's apparatus. Thorough scraping of the affected parts, followed by the application of a caustic antiseptic, such as pure phenol or the galvanic cautery, has given good results. Atresia of the nostrils is treated surgically, the patient wearing a rubber or celluloid tube for several months after the operation. Lupus of the palate yields, at least temporarily, to applications of the $x$-rays. Where it is impossible to apply these, regular paintings of the parts with iodine (one in five), lactic acid (60 per cent), trichlor-acetic acid, and similar caustics give good results. The gums, lips, and tongue can sometimes be treated by the $x$-rays, but more conveniently by one of the caustics just mentioned. Relapses are exceedingly common in all forms of mucous membrane lupus.

It must be borne in mind that no local treatment, however radical, removes the constitutional predisposition; hence it is impossible to promise that the most successful result will ensure permanent immunity from recurrence. It cannot, however, be too strongly urged that thorough treatment should be employed at the earliest possible moment

in the course of the disease, as there is no doubt that the patch of lupus is a nursery for infective germs which may migrate to parts more vital than the skin (Darier).

MILIARY TUBERCULOSIS OF THE SKIN.—The acute ulcer described later is included by some authors as a form of miliary tuberculosis of the skin, but there is another group of cases in which the lesions consist of scattered papules or papulo-vesicles. The patients are children, and the cutaneous affection is usually part of a generalised miliary tuberculosis. Most of the reported cases appear to have followed measles, and their development closely resembles that of the cases of lupus disseminatus post-exanthematicus (*vide* p. 468). As Dr. H. G. Adamson suggested in regard to these cases, the exanthem probably causes the disintegration of a tuberculous focus in a gland or elsewhere, and the dissemination of the bacilli by the blood stream.

The lesions are multiple acuminate red papules or papulo-vesicles varying in size from a pin's head to a hemp seed, rarely larger. Sometimes there is a minute pustule. The eruption comes out widely in a week to a fortnight. Many of the lesions undergo involution with the formation of small scales or crusts. The papules shew the characteristic structure of a tubercle, and contain large numbers of Koch's bacilli, and inoculation of guinea-pigs gives positive results. In rare instances chronic lesions of a similar type have been seen after measles. The prognosis depends on the primary disease. In most cases death occurs from tuberculous meningitis (*vide* also Vol. VIII. p. 223).

TUBERCULOUS ULCER (*Tuberculosis miliaris ulcerosa; Tuberculosis cutis orificialis* (Hyde and Montgomery)). — **Definition.** — The name "tuberculous ulcer" is reserved for an acute ulceration of the skin caused by the bacillus of Koch. The ulcerating forms of lupus vulgaris and of scrofulodermia are excluded.

**Etiology.**—Tuberculous ulcers are rare except in patients suffering from visceral tuberculosis. They may possibly be caused by infection through the blood stream, but their characters and distribution suggest a local infection by virulent bacilli. The lesions occur: (1) about the mouth and nose in cases of advanced pulmonary tuberculosis. Infection by sputum is the most likely cause. The parts affected are the lips, especially the lower, the buccal mucosa, tongue, pharynx, and nostrils; (2) about the anus. Virulent bacilli in the faeces derived from intestinal ulcers and possibly from swallowed sputum are the infecting agents. A fistula is often associated with the ulcer; (3) on the external genitals in cases of genito-urinary tuberculosis. Mr. Hugh Lett recently sent me a lad with tuberculous ulceration of the glans penis, starting from the meatus urinarius. The patient was suffering from tuberculous disease of the kidneys and bladder, which rapidly proved fatal.

Tuberculous ulceration occurring elsewhere is exceedingly rare. Darier mentions an ulcer on the forehead occurring in a healthy woman infected by a tuberculous husband. Ritual circumcision has been followed by tuberculous ulceration of the penis. Lehmann records the infection of ten healthy infants by a rabbi suffering from pulmonary tuberculosis. Koch's bacilli are found in large numbers in the lesions, and the inoculation of guinea-pigs gives positive results.

**Morbid Anatomy.**—The overhanging of the edge of the ulcer is well seen in sections, and is very characteristic. The base of the lesion consists of a fibrinous layer over a mass of pus-infiltrated tissue. The granular nodules contain giant cells, epithelioid cells, and a surrounding zone of lymphocytes and plasma cells. Tubercle bacilli are present in large numbers.

**Symptoms.**—The lesions at the onset are small, dull-red elevations, which rapidly break down into ulcers, which spread peripherally, but are always shallow. As a rule they are of an ovoid or irregular shape, with a festooned outline. About the anus and mouth they may take a linear form. They vary in size from a quarter of an inch or less to half an inch in diameter, occasionally more. The edge of the ulcer is undermined, the base irregular and granular, and often covered with a greyish slough. Exudation is scanty, and often contains a little blood derived from minute haemorrhages on the surface of the ulcer. Around the margin and at the base yellowish granules the size of a pin's head are usually present (Trélat). In rare cases papillomatous growths appear on the surface of the lesion. In situations liable to friction and movement a tuberculous ulcer may be exceedingly painful.

The evolution of the tuberculous ulcer may be very rapid, a matter, perhaps, of a few days. Extension of the process may continue for several weeks to several months, but there is no tendency to spontaneous healing. The nearest lymphatic glands are enlarged.

**Diagnosis.**—The tuberculous ulcer has to be distinguished from traumatic ulcers, soft sores, Hunterian chancre, and squamous-celled carcinoma. Traumatic ulcers heal up under ordinary antiseptic treatment. The soft sores and their attendant bubo tend to suppurate early. The induration of the Hunterian chancre is a good guide, but in a doubtful case fluid from the sore should be examined for spirochaetes. Carcinoma may lead to difficulty, and may require a biopsy to make a diagnosis. In any case of doubt, the surface of the ulcer should be scraped and examined for tubercle bacilli, and the inoculation of a guinea-pig or the application of one of the new tests for tuberculosis may be made.

**Treatment.**—If the patient is the subject of visceral tuberculosis the lesions may be dressed with an ointment of peroxide of zinc, 10 grains to the ounce, or with iodoform, europhen, or the like. Regular painting of the ulcer with a 60 per cent solution of lactic acid has been recommended. Iodine, one in five, is also a useful application. If there be much pain cocaine may be added to the local applications. Radical treat-

ment is not advisable as the patient is usually gravely ill from the visceral disease. Where there is no visceral tuberculosis, the lesion should be excised and the parts cauterised, because there is grave danger of general infection. Any infected glands should be dealt with surgically.

TUBERCULOSIS VERRUCOSA.—SYN.: *Anatomical tubercle; Necrogenic wart; Scrofulide verruqueuse* (Hardy); *Lupus verrucosus* (McCall Anderson); *Lupus sclerosus et papillomatosus* (Vidal and Leloir).

**Definition.**—Tuberculosis verrucosa is the name applied to warty lesions of the skin caused by the direct inoculation of tubercle bacilli.

**Etiology.**—A warty tuberculous lesion of the skin may be the direct result of auto-inoculation in patients suffering from pulmonary tuberculosis. It has been seen to follow tattooing (Ernst), but most commonly occurs in medical men, students, and nurses in attendance on patients suffering from "open" tuberculous disease. I have seen a case in which a mother had been infected by washing handkerchiefs used by a consumptive child. Contact with human and animal cadavers infected with tuberculosis is the cause of necrogenic warts in pathologists, post-mortem room attendants, veterinary surgeons, and butchers. Koch's bacilli are found in the lesions in greater number than in the nodules of lupus vulgaris, but they are not so numerous as in the tuberculous ulcer.

**Morbid Anatomy.**—The warty tuberculous lesion shews under the microscope definite tubercles with giant cells containing Koch's bacilli, four or more, perhaps, in each. There are miliary abscesses in the vascular layer of the skin and great increase in the horny layers of the epidermis.

**Symptoms.**—The parts most exposed to infection, namely the hands, fingers, and thumbs, are the most common sites. I have once seen the face attacked. The primary lesion is usually a small erythematous swelling followed by a minute pustule. The affected area is uninfluenced by the usual antiseptic dressings, and becomes indurated, and slowly increases in size. Ultimately it commonly forms a warty nodule surrounded by a red halo. Small drops of pus may be expressed from it, and in the pus tubercle bacilli may be found. The lymphatic glands are involved early.

In another type of case the lesion forms an oval, rounded, or lobulated plaque, which spreads slowly for several months or even years. It may be the size of a small coin or occupy an area several inches across. An old man under my care was infected through a wound produced by an electric lighting wire while he was working in a butcher's shop. A small indolent sore formed at the point of injury, and this gradually spread, and when I saw him, three years after the injury, the whole of the back of the left hand was involved. The characters of the lesion then were a central, rather depressed area of scar, surrounded by a ring of small, purplish, warty nodules covered with a putty-like crust, and outside this again there was an area of erythema. These three zones are characteristic

of this form of skin tuberculosis. The base of the lesion may be infiltrated or oedematous. The glands are infected early and visceral disease is a common sequel. The old man above referred to lost his arm from extension of the disease into the joints.

**Diagnosis.**—The tuberculous lesion has to be distinguished from blastomycosis, extra-genital chancre, and carcinoma. The multiplicity of the lesions and the presence of yeast-like organisms in the pus serve to differentiate blastomycosis. An extra-genital chancre may present many points of similarity. In a case in which the infection occurred in the out-patient department of the London Hospital, Mr. Russell Howard and I found it exceedingly difficult to make a diagnosis. The infection occurred at the root of the nose, and a large bubo appearing under the angle of the jaw led us to suspect syphilis, but Wassermann's test was applied several times with negative results. Ultimately the gland began to suppurate, and in the pus the tubercle bacillus was found. In a doubtful case the spirochaete should be sought for, or a portion of the suspected tissue may be removed and injected into a guinea-pig. As already mentioned, tubercle bacilli can often be demonstrated in the pus and sections of the granuloma. Microscopical examination may be necessary to exclude carcinoma. The clinical characters are usually sufficient to differentiate between the warty tuberculosis and common lupus.

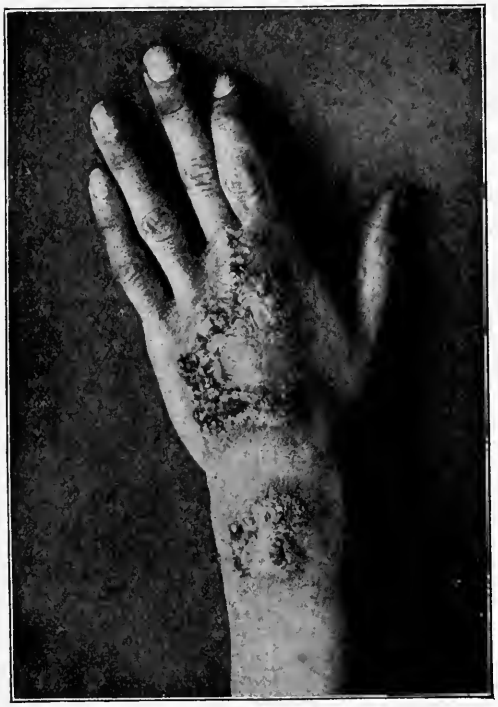

FIG. 103.—Tuberculosis verrucosa.

**Treatment.**—In acute cases excision of the affected area is indicated, or the disease may be destroyed by the actual cautery. In the less acute forms Bier's treatment may be tried, but I have obtained excellent results by removing the warty surface by pyrogallic acid or by salicylic acid, and the subsequent application of the *x*-rays.

SCROFULODERMIA (*Tuberculous gumma*).—This name is applied to several forms of tuberculous abscess affecting the hypoderm and deeper

layers of the corium, usually over a disintegrating tuberculous lymphatic gland or diseased bone or joint, and tending to open in the centre and to leave an undermined ulcer.

**Etiology.**—Tuberculous gummas are met with most often, but not always, in patients whose general health is poor, or in those who are the subjects of tuberculosis of the glands, bones, joints, and, less commonly, of the viscera. Children and young adults are the most frequent sufferers.

**Pathology.**—The tuberculous gumma is formed of a collection of tubercles which undergo caseation. The neoplasm may be enclosed in a fibrous capsule, but is more commonly ill-defined and diffuse. Tubercle bacilli are sometimes abundant, and sometimes few in number. Inoculation of guinea-pigs gives a positive result. In the lymphatic variety the lesions are no doubt due to embolic infection. Hallopeau and Goupil found staphylococci and streptococci in addition to the bacillus of Koch in their case.

FIG. 104.—Scrofulodermia.

**Symptoms.**—The lesions may be single or multiple. The neck, groins, and limbs are the favourite sites, but the face and trunk are occasionally attacked. Sometimes the lesions are distributed in the course of lymphatic trunks, a form which will be described separately (p. 486).

The primary lesion is a painless swelling in the hypoderm or in the deep part of the cutis. The skin over the tumour soon becomes of a purplish or livid tint, and on palpation the central parts of the lesion are felt to be soft. As a rule, disintegration of the tuberculous gumma leads to the formation of an ulcer, but in rare instances spontaneous absorption occurs. The ulcer has an irregular outline, and the thin bluish edge is undermined. The cavity is irregular, and covered with pale flabby granulations, upon which is a greyish-white or purplish debris. Examination with a probe may reveal fistulous tracks running in one or more directions. The walls of the ulcer are usually indurated. Sometimes there are several orifices by which the broken-down tissue is discharged,

and the coalescence of several neighbouring tumours may lead to an infiltration, containing several irregular communicating cavities crossed by bridges of thin purplish skin. The discharge from the ulcer is sanious, or thin and serous, or purulent, and tubercle bacilli are often found in it. The tendon sheaths, bones, and joints may be invaded. The lesions may spread widely from the original focus, in the form of indolent ulcers which remain discharging for several months or years unless vigorously treated. When healed the scar is usually irregular, and often crossed by fibrous bands, and small tags and even bridges of skin are occasionally left. Some purplish discoloration followed by pigmentation of the cicatrix may persist for several months. Deep adhesions of the scar are common.

*Course.*—Scrofulodermia progresses slowly and may last for several months to several years.

*Tuberculous lymphangitis*, first described by Bazin, is seen chiefly on the limbs. It starts from a tuberculous lesion on the extremity, such as tuberculosis verrucosa or caries of a bone. In a characteristic case under my care, the primary affection was a warty ulcerating lesion on the little toe. Five separate swellings, the size of a hazel nut, appeared in the course of the lymphatics accompanying the short saphena vein, the highest being just below the popliteal space. The lesions were purplish-red in colour and infiltrated. They soon broke down into ulcers with undermined edges discharging a thin sanious pus. Depressed pigmented scars were left. Besides the gummatous swellings there was considerable enlargement of the limb, pseudo-elephantiasis. The patient also had lupus vulgaris of the face, and later developed a tuberculous focus in the head of the tibia. In some cases a cord-like swelling along the course of the lymphatics can be felt. Hallopeau and Goupil described a condition of lymphangiectasis, with varicose swellings of the lymphatic vessels, and lymph from these vessels was found to contain tubercle bacilli. The nearest lymphatic glands are usually affected, and visceral tuberculosis is a not uncommon sequel.

**Diagnosis.**—Scrofulodermia must be distinguished from syphilitic gumma, from Bazin's disease, from mycosis fungoides, and from some of the rare granulomas due to vegetable organisms.

The *syphilitic gumma* is more acute in its development; the ulcers are punched out, not undermined, and their outline is circular or polycyclic. Other signs of syphilis are usually present. It will be remembered that, as a rule, the tuberculous gumma is associated with tuberculous disease of glands, bones, or joints.

*Erythema induratum* (Bazin) occurs almost exclusively in girls and young women, attacks both legs, usually the calves. Tubercle bacilli are found with extreme difficulty, but positive reactions from inoculation experiments have proved successful. The two conditions are, however, extremely closely related.

*Mycosis fungoides* should not present difficulty. There is nearly always a history of a pre-mycotic stage, with eczematous, scaly, and urticarial

eruptions, and patches of erythrodermia. Itching is a prominent and constant feature.

*Streptotrichosis* and *blastomycosis* are diagnosed by the detection of the respective organisms of these diseases in the pus from the lesions.

**Treatment** by operation is usually satisfactory. Disease of the glands, bones, or joints must be eradicated by suitable means, the skin lesions being excised at the time. Should the ulcer be confined to the skin and subcutaneous tissue, it may be sufficient to apply an ointment of iodoform, aristol, or salicylic acid. Treatment by the *x*-rays is often of great value, and may be used with most advantage after the removal of the undermined skin and granulations by the curette. In some cases the whole lesion can be removed by excision with closure of the wound by suture or, if this is impracticable, by the application of an epidermic graft immediately or after the establishment of healthy granulations. Dr. Western has treated several of my cases of extensive scrofulodermia with tuberculin (T.R. or T.B.E.) with great benefit, doses of $\frac{1}{1000}$ of a milligram being administered every ten days. The general health of the patient requires attention and good feeding, and, if possible, prolonged residence at the sea-side, particularly on the East Coast, should be obtained.

TUBERCULOSIS FUNGOSA ET VEGETANS (*Tuberculosis framboesiformis*).—Fungating tuberculous lesions were first studied by Riehl. They occur as red, irregular, lobulated, soft tumours or as nodulated plaques. The surface of the tumours may be ulcerated or covered with crusts, and partial cicatrisation is not uncommon. They may be the result of direct inoculation or of infection of the skin from a glandular, bony, or articular focus. The disease occurs usually on the limbs. In a patient under my care the condition was associated with lymphatic obstruction and pseudo-elephantiasis of the left upper limb. The fungating masses were numerous, and several covered an area two or three inches across, standing above the surface for half an inch. Free scraping of the fungating masses and the application of the *x*-rays led to extensive scarring, with deep adhesions which greatly impaired the movements of the limb. In this case local inoculation appeared to be the cause.

Framboesiform lesions have been described by Doutrelepont, Wickham, Hallopeau, and others. The tumour formations of tuberculous origin have to be distinguished from other neoplasms, mycosis fungoides, carcinoma, sarcoma, etc. The remarks made above on the diagnosis of the tuberculous gumma apply here, and in a doubtful case a biopsy should be made.

CHRONIC TUBERCULOUS ULCERS.—There occur occasionally chronic ulcerations of a rounded or oval or irregular shape, varying in size from a two-shilling piece upwards, with soft, sometimes undermined, edges, which are believed to be tuberculous. I have seen them on the legs, and occasionally elsewhere. The margin of the ulcer is often of a violet

or of a dull-red colour, the base is covered with a greyish slough or it may be bright red. It is usually extremely difficult to determine whether the lesions are syphilitic or not. Tubercle bacilli are not found in the exudate, but in one case I have obtained a positive reaction with Calmette's test. Wassermann's reaction is negative, and mercury has no effect. They heal, as a rule, with rest in bed and repeated small doses of the *x*-rays.

The Tuberculides.—These eruptions occur in patients infected, or believed to be infected, with the tubercle bacillus, but it is only exceptionally that the organism is demonstrable by the microscope or by experiment. The name was suggested by Darier by analogy with the "syphilides." There are two hypotheses to account for these conditions. Hallopeau believes them to be caused by toxins derived from some distant tuberculous focus circulating in the blood, in the same way that an injection of tuberculin may cause an erythema and, rarely, lichen scrofulosorum (Schweninger and Buzzi). With this opinion Boeck agrees, laying stress upon the symmetrical distribution of the tuberculides, and he explains the occasional presence of Koch's bacilli in the lesions as not surprising in a patient suffering from active tuberculosis in some other part of the body. Haury believes that the tuberculides are produced by embolism of tubercle bacilli of low vitality, which probably die early from the effects of phagocytic action. This hypothesis is supported by Darier and Jadassohn. In its favour it may be remarked that, as further observations are made, tubercle bacilli are found in more forms of tuberculide, and positive results from the injection of guinea-pigs have been obtained in several conditions in which the bacilli have not yet been demonstrated. Riehl, Neisser, and Audry point out that the injection of tuberculin rarely produces lesions of the tuberculide type, and opinion has lately tended to favour the views of Haury. Zieler in a recent experimental research asserts that he has proved that the lesions are caused by toxic bodies and not by the bacilli, and if his investigations are confirmed, the toxin hypothesis of Hallopeau may be considered as proved to be correct, at any rate for certain types of tuberculide. At present the following forms of disease are included in the group of tuberculides: (1) Lichen scrofulosorum; (2) Papular and nodular tuberculides, folliclis, acnitis, acne scrofulosorum, acne cachecticorum, etc.; (3) Certain forms of disseminated lupus according to Darier; (4) Erythema induratum of Bazin.

Many authors include lupus erythematosus in all its forms, lupus pernio, and the angiokeratoma of Mibelli. Jadassohn regards the pityriasis rubra of Hebra as a tuberculide, and certain French authors include some forms of chilblain and acro-asphyxia. Recent experimental work suggests that some conditions called erythema nodosum are tuberculous (see pp. 256, 494).

**Lichen scrofulosorum** is the commonest tuberculide. Its relationship with tuberculosis was first pointed out by Hebra.

*Etiology.*—The patients are usually children or adolescents, and the disease is rare after twenty-five. Hebra's observation that boys are more affected than girls is not the experience in this country. As a rule, lichen scrofulosorum occurs in patients suffering from tuberculous disease of the glands, bones, or joints. It is very rare in pulmonary tuberculosis. Cases have been recorded in which the eruption followed measles. Schweninger and Buzzi's observations that an injection of the old tuberculin may be followed by an eruption of lichen scrofulosorum have recently been confirmed by Lesseliers. He agrees with Jadassohn that the outbreak is so rapid that the patient is probably tuberculous already, and that the injection acts as a further stimulus to the development of the lichen eruption. It is exceedingly difficult to demonstrate Koch's bacillus in the lesions, but Jacobi and Sack have been successful. Positive results from the inoculation of guinea-pigs have been recorded by Jacobi, Pellizarri, and Haushalter.

*Pathology.*—Jacobi shewed the lesions to be essentially a tuberculous folliculitis, composed of miliary tubercles with no tendency to caseation. Lesselliers in 14 out of 17 cases found a "typical tuberculous structure," that is to say, epithelioid cells and giant cells. The lesions which appeared in response to tuberculin injections had the usual characters. Jadassohn obtained a local reaction with tuberculin in 14 out of 16 cases, and Jacobi and Sack demonstrated the tubercle bacillus in the lesions.

*Site.*—The eruption occurs on the chest, abdomen, back, and occasionally on the limbs. Hyde described one case in which the face was also affected.

*The eruption* consists of rounded papules, varying in size from a pin's head to a millet seed. They are of a pale yellow or brownish-red colour, and sometimes differ very little in tint from the surrounding skin. There may be a central depression to the papule, and there is often a tiny, adherent scale, or horny plug, or a miliary pustule. As a rule, the lesions are disposed in groups, often oval in shape and covering a moderately large area, or they may be arranged in crescentic form. They do not cause any symptoms, and are often unnoticed by the patient. They last for several months and even for years, gradually clearing up without, but occasionally with, scarring. Recurrences are not rare. Boeck has described an eczematous form of the lesion which may be associated with the common type.

*Diagnosis.*—Lichen planus is distinguished from lichen scrofulosorum by its distribution, by its non-crescentic arrangement, and the colour, duration, and itching of the lesions. There is also the absence of tuberculous disease.

Acne is rare in infancy and childhood, and affects the face and upper part of the trunk, the lesions suppurate, and there are comedones. Papular eczema itches a good deal, scaling is usually in greater amount, and vesication is common. The papular syphilide is distinguished by its colour, by the marginate scaling of the lesions, and other evidence of

syphilis. In pityriasis rubra pilaris, the dorsal aspect of the fingers and the face are affected.

The *prognosis* is favourable, the eruption clearing up under treatment. Its presence is, however, an indication that the patient is tuberculous.

*Treatment.*—Hebra and Hallopeau have advocated the use of cod-liver oil, both internally and externally. Arsenic internally is also of service. Locally, ointments of ichthyol, resorcin, and tar are of value. The patient should have plenty of good food, and live as much as possible in the open air, preferably by the sea.

**Papular and Nodular Tuberculides.**—In this group there is a long series of eruptions intermediate between lichen scrofulosorum and the erythema induratum of Bazin. In 1879 Sir J. Hutchinson described one form as a variety of lupus, and in 1880 Boeck a similar case as lupus erythematosus. In his report on the tuberculides, presented to the International Congress at Paris in 1900, Dr. Colcott Fox collected more than twenty names which had been given by different observers to members of this group. As he points out, the eruptions have certain common characters, bilateral symmetry, and a tendency to affect the periphery often in association with acro-asphyxia. The depth of the lesions, the involvement or non-involvement of the glandular elements of the skin, the amount of necrosis, and the distribution of the eruption give different characters clinically which account for the abundant nomenclature.

*Etiology.*—The patients are usually young, and there is often tuberculosis of the glands or of the lung, or some other form of tuberculosis of the skin. Tubercle bacilli have been described in some of the lesions (Philippson, MacLeod and Ormsby). Philippson obtained positive results from the inoculation of guinea-pigs, and his observations have been confirmed by Leiners and Spieler. In one case I obtained a positive result with Calmette's ophthalmic test.

*Morbid Anatomy.*—Leredde found that the primary lesion is about the vessels, and Philippson shewed that phlebitis, probably due to infected plugs, is the earliest stage. Cellular infiltration, both of lymphocytes and of fixed cells, is found about the small arteries and veins in the true skin. Giant cells are present, and Philippson and MacLeod and Ormsby have detected tubercle bacilli. The necrotic change depends upon the caseation of the nodules.

*Small Necrotic Type* (Folliclis of Barthélemy).—The eruption consists of flattened, rounded papules, beginning in the deep part of the skin and giving the sensation of small shot embedded there. The lesions vary in size from a pin's head to a lentil, and are of a dusky red or livid purple colour, surrounded by a zone of erythema. Sometimes the papules remain in this condition for some weeks, and occasionally they disappear spontaneously, leaving small pigmented spots. As a rule, however, a small vesicle containing serum and ultimately pus appears in the centre of each lesion, and the exudate dries up to form a small umbilicated adherent crust, which is found on removal to be cone-shaped.

The ulcer revealed by the removal of the crust is small and deep, and runs an indolent course. Sometimes two or more ulcers may coalesce to form irregular-shaped lesions. The healing of the ulcers is followed by pigmentation and scarring. In time the cicatrices become pale and depressed. There is no pain, but the spots may be tender and occasionally itch. An individual lesion may last for several weeks, but crops continue to come out for months and sometimes for years. In two children suffering from this form of tuberculide on the legs I observed symmetrical painless swelling of the knee joints.

Site.—Parts which are subject to acro-asphyxia are prone to the disease. The limbs, especially the hands and feet and the elbows and knees, are the seats of election. The auricles are also frequently affected, and the recurring necrosing papules undergoing cicatricial transformation lead to atrophy of the lobules. The palms and soles may be attacked, but the face is very rarely invaded. As a rule, the outbreaks occur in the spring and autumn.

Prognosis.—The lesions are often chronic, but otherwise the outlook is favourable. The presence of the eruption is, however, evidence of tuberculosis.

*Acne Scrofulosorum* (Colcott Fox, Radcliffe Crocker, Pringle). — This variety of tuberculide appears to be less commonly recognised on the Continent than in this country. The patients suffer from tuberculosis of the glands, and Stanley described a case in which the eruption recurred year after year in April, and was always associated with enlargement of the glands.

The eruption consists of small reddish papules about the size of a millet seed. Each papule is surmounted by a small pustule with a central hair. The pus dries up into a little crust, which covers a small ulcer. The lesions leave pigmented scars which ultimately become pale. The upper limbs, from the thumbs to the shoulders, and the lower extremities are affected. The eruption has a predilection for the extensor surfaces. The lesions are rare on the trunk, and very rare on the face.

*Acne cachecticorum* of Hebra and Kaposi occurs on the face, back and chest, and on the lower limbs. The lesions are papules and pustules, varying in size from a pin's head to a lentil. They have a livid colour, and, as Kaposi pointed out, resemble a syphilide very closely. Sometimes there are haemorrhages into the pustules. Small scars or pigmented spots are left. The eruption may persist for several years, but resolution takes place with improvement of the general health. Hebra described the condition as occurring in cachectic, especially tuberculous, subjects.

As an illustration of the association of the varieties of tuberculide, Darier described the case of the patient with pulmonary tuberculosis in whom the cervical, axillary, and inguinal glands were tuberculous, the cutaneous lesions being of the type of acne cachecticorum on the trunk, of folliclis on the limbs, and there was also tuberculous ulceration.

*Acnitis* (Barthélemy), (Acne agminata of Radcliffe Crocker). — This name was applied by Barthélemy to a group of cases which he dis-

tinguished from folliclis, believing them to be due to auto-intoxication from the alimentary canal. The relationship with tuberculosis is still in dispute. Schamberg in a recent paper dissents from the tuberculide hypothesis; Leredde, Colcott Fox, and others include it; whereas Boeck classes it as doubtful. Hebra described the condition as acne varioliformis, Pollitzer as hidradenitis destruens suppurativa, and Kaposi as acne telangiectodes.

The eruption consists of rounded, brownish papules imbedded in the skin. At the onset they are about the size of a millet seed, and in the course of ten days or so they increase perhaps to the size of a pea. The forehead and the temples are the parts most affected, but lesions also occur on the eyebrows and eyelids, at the angle of the jaw, and occasionally on the trunk and limbs. There is no fever and no pain, but there may be slight itching. At an early stage the lesions become red and soften, and small pustules form. The exudation is scanty, and dries up into pus-crusts which fall off, leaving small scars with pigmented margins. The indolence of the eruption is a characteristic feature. It resists all the usual remedies for acne.

*Differential Diagnosis of the Papular and Nodular Tuberculides.* — The diagnosis of these tuberculides depends upon the presence of small papules and nodules in the true skin, especially affecting the extremities. Their long duration distinguishes them from small-pox, in which there are the symptoms of fever, pain in the back, etc. In acne vulgaris the lesions are more acute, the face and upper part of the trunk are affected, and comedones are present. Lupus erythematosus involving the ears does not present the papular and necrotic character of the tuberculide, and, as a rule, there are lesions on the nose and cheeks.

*Treatment.*—All these forms of disease must be recognised as evidence of tuberculosis, and the treatment directed to the improvement of the general health, good feeding, residence by the sea-side, and so forth, must be carried out if possible. The local treatment consists in the application of stimulant antiseptic ointments or lotions. The red oxide of mercury ointment is a useful preparation. If the extremities are affected rest must be prescribed. Small doses of the new tuberculin may be given with advantage.

**Multiple Benign Sarcoid** of Boeck (Lupoïde miliaire and Lupoïde tubereuse).—There are two types of this rare condition which appears to be related to the tuberculides, both by its histological characters and by its association with the papulo-necrotic and other forms of undoubted tuberculide.

In the *miliary form* the eruption consists of hemispherical elevations, varying in size from a millet seed to a pea, of a pinkish colour at first, then livid, and finally brownish. The surface of the papules is smooth or very slightly scaly. They are of soft consistence, and under glass-pressure are not so translucent as the nodules of lupus vulgaris. They occur symmetrically on the face, shoulders, and the extensor aspects of the upper limbs. Occasionally the scalp, back, and lower limbs may

be affected. The eruption comes out in a few weeks, and the individual lesions slowly increase in size, and fresh spots appear. There is never any ulceration, and the lesions eventually flatten, forming stains which leave atrophic scars. The disease may last for five or ten years.

Females between the ages of fifteen and forty are the usual sufferers, males are rarely affected. The lymphatic glands may be enlarged, and there is often visceral tuberculosis.

Microscopically the lesions consist of masses of epithelioid cells, lymphocytes, and, rarely, giant cells. There is little or no inflammation.

In the *nodular type* the lesions have the hemispherical form or are discoid. They may be as large as a small nut, and have a purplish tint. There may be two or three or as many as a dozen tumours on the forehead, neck, shoulders, elbows, and knees. The structure is similar to that of the small variety.

*Treatment.*—The general hygiene requires attention, and good feeding is necessary. Injections of tuberculin and of calomel are recommended. Boeck found good results from the internal administration of arsenic.

**Tuberculides of the Hypoderm.**—Two conditions require consideration—the erythema induratum of Bazin and the hypodermic sarcoid of Darier and Roussy.

*Erythema induratum* of Bazin is a chronic disease affecting almost exclusively young girls. It is characterised by symmetrical node-like swellings of the hypoderm, usually of the legs, but occasionally of the upper limbs. The lesions are chronic, and tend to break down into ulcers of indolent character.

Etiology.—Erythema induratum begins, as a rule, in adolescence. It is rare after twenty-five. The patients are usually young girls, and often those who have to stand a great deal at their occupations, such as shop-assistants and young servants. In my experience its onset often coincides with the great increase in the body weight which occurs about the time of puberty in many young females. The adipose tissue of the lower extremities in these patients often appears to be excessive and flabby, and this may predispose to the affection. That the standing position has a great deal to do with its occurrence is seen by the rapid disappearance of the lesions with rest in the horizontal position. The patients are often overworked and underfed, and evidence of tuberculosis, past or present, in the lymphatic glands is not uncommon. Dr. Galloway and others have seen young lads affected.

Pathology.—Dr. Whitfield found that the liquid removed from a nodule which had softened, but had not ulcerated, resembled liquid fat, but on digesting the material tubercle bacilli could not be detected. Audry found the same oily matter contained in an alveolated spongy tissue, infiltrated with mononuclear cells. Thibierge and Ravaut shewed that the lesions occur in the subdermic tissue, which is divided into lobules by bands of connective tissue, in some of which there are normal fat-cells, and in others the place of the fat is taken by cell-infiltration.

They demonstrated giant cells and epithelioid cells. The ulcers are caused by a granular necrosis of the cell elements, and destruction of the skin over the nodules. The bacillus of Koch has not been demonstrated in the lesions, but Dr. Colcott Fox and Thibierge and Ravaut record positive results with the inoculation of guinea-pigs. Erythema induratum gives positive results with Koch's old tuberculin and to the ophthalmic and cutaneous tests. I have recently seen a young woman who was being injected with tuberculin (bacillary emulsion) by Dr. Western for tuberculous disease of the ankle, in whom erythema induratum developed after several injections had been given. Dr. Western informs me that he has had another case in which the same result followed the use of the same injections for tuberculous glands of the neck.

Gougerot records the experimental reproduction of the lesions of erythema induratum, but the most interesting observations have been made by Thibierge and Gastinel and by Bartier and Lian, who have produced lesions identical with erythema nodosum with intra-dermic injections of the old tuberculin, and Marfan has obtained positive reactions with the von Pirquet test in six cases of erythema nodosum. It appears probable, therefore, that some of the cases of this disease are closely related to Bazin's disease.

Dr. Whitfield in an interesting paper on multiple inflammatory nodules of the hypoderm shews that the anatomical structure of the tuberculide lesions does not differ materially from certain non-tuberculous conditions occurring in older patients.

Symptoms.—The lesions are red or purplish, ill-defined, indurated plaques of various sizes, usually about $\frac{1}{2}$-$\frac{3}{4}$ inch in diameter. They appear almost always in the lower part of the calf and on the outer aspect of the legs. The lesions are usually multiple, and both legs are affected. Sometimes there are similar lesions on the upper limbs, and conditions indistinguishable from erythema induratum have been recorded on the forehead. The swellings develop subacutely, and from time to time they may increase in size and in the amount of congestion. If the patient be put at rest in the horizontal position, the lesions may subside entirely, but in many cases ulceration occurs, especially with long standing in the erect position. The French authors apparently find ulceration more rare than is the experience of British observers. The ulcer is usually deep and of variable size; its edge is generally irregular, the base being of a greyish or red colour, often with a granular appearance. The surrounding area is infiltrated, and usually of a deep-purplish tint. The ulcers run an indolent course, and when healed leave scars, at first deeply pigmented, and ultimately white and atrophic, closely resembling syphilitic scars from which they can usually be diagnosed by the symmetrical affection of both legs.

Diagnosis.—The diagnosis of erythema induratum of Bazin depends upon the development of symmetrical hypodermic nodules, usually in the legs (rarely the arms), in young girls and young women. Their chronicity

and symmetry differentiate them from syphilitic gummas. They are independent of sinuses leading to tuberculous foci, and this separates them from the tuberculous gumma (scrofulodermia). The age and the absence of varicose veins are points of distinction from the hypodermic nodules which occur in older women.

Treatment.—It is essential that the patient should be kept at rest in the horizontal position. In the non-ulcerated cases rest with good feeding is all that is needed. In the ulcerated cases the ulcers require the application of stimulant antiseptic dressings. I have found the red oxide of mercury ointment of great value. I have also seen marked improvement with Bier's congestion treatment. I have tried the new tuberculin in small doses, but Dr. Western and I agree that there has been little benefit. In one case we noticed that the ulceration increased in area. The development of erythema induratum while inoculation with tuberculin for other lesions was in progress does not lead one to expect favourable results.

*Hypodermic Sarcoids of Darier and Roussy.*—The conditions described under this name, which Darier looks upon as akin to erythema induratum, are indolent neoplasms of subacute or chronic evolution, without any tendency to generalisation or to ulceration. They have no influence on the general health, and have been chiefly seen in females between the ages of thirty and forty years. The lesions vary in size from a pea to a nut, and are often confluent, forming nodular patches or "cordons." They occur in variable number, and any part of the body may be affected, notably the trunk in the costal regions. Microscopically the lesions shew tuberculous follicles at their periphery, containing giant cells, epithelioid cells, lymphocytes, and a fibrous envelope. The tuberculous nature of these "sarcoids" has not been proved by inoculation, and tubercle bacilli have not been detected.

LUPUS ERYTHEMATOSUS.—SYN.: *Seborrhoea congestiva* (Hebra); *Érythème centrifuge* (Biett); *Vespertilio or bat's wing disease* (Balmanno Squire); *Lupus erythematodes* (Cazenave); *Ulerythema centrifugum* (Unna).

Lupus erythematosus is an inflammatory disease of the skin of probably toxic origin. The lesions are usually symmetrical and circumscribed, and lead to atrophic cicatrisation without ulceration.

There are two distinct types (1) a chronic localised, "discoid," or "fixed" form, and (2) a disseminated variety, which may run an acute course. Characteristic examples of the two types differ in so many respects that it is difficult to conceive that they own a common cause, but the chronic form may be succeeded by the acute, and there are intermediate conditions which are difficult to place.

**Etiology.**—It will be convenient to compare the two forms, as there are several important points of difference.

*Sex.*—Of 143 consecutive cases of the discoid type seen at the London Hospital, 27 were males and 116 females, respectively 19 and 81 per cent. Of 15 cases of the disseminated form all were females.

*Age.*—In the discoid cases, the ages at which the disease first appeared is set out in the following table:—

| | Males. | Females. | Per cent. |
|---|---|---|---|
| Under ten years . . | 1 | 4 | 3·5 |
| Between 11 and 20 . . | 7 | 30 | 25·9 |
| Between 21 and 30 . . | 11 | 51 | 43·3 |
| Between 31 and 40 . . | 5 | 22 | 18·8 |
| Between 41 and 50 . . | 1 | 6 | 5·0 |
| Between 51 and 60 . . | 2 | 3 | 3·5 |
| | 27 | 116 | 100·0 |

The youngest patient was five years old. Kaposi's youngest case was aged three years. Galewsky and Stowers have also seen children of five affected. Among the London Hospital cases there were two pairs of sisters, and Róna has recorded it in a brother and sister.

In the disseminated form, five of my fifteen patients were first affected between the sixteenth and twentieth year, and six between twenty and thirty. The oldest patient was forty-three.

Relationship to Tuberculosis.—As Sir J. Hutchinson first pointed out, a history of pulmonary tuberculosis in the family is very common. It occurred in 47 of my fixed cases (about 33 per cent), and in 12 out of 15 of the disseminated cases (80 per cent). Other tuberculous diseases were too indefinitely indicated in the histories to be of any real value. As regards tuberculosis in the patients themselves, there are very variable accounts. Roth gives statistics of 250 collected cases, in which no fewer than 185 were tuberculous. Balean and I carefully examined 60 discoid cases, and were only able to find evidence of tuberculosis, such as phthisis, tuberculous glands, joints, and bone in 18 per cent. Boeck found evidence of scrofulo-tuberculosis in 24 out of 36 discoid cases. In the disseminated form, on the other hand, there is a much greater proportion. Seven of my fifteen patients had pulmonary tuberculosis, and three of these also had tuberculous glands, and in three others there were enlarged glands, or the scars of glandular abscesses. In my one fatal case, however, the only tuberculous lesion was a calcareous nodule at the apex of one lung. Recently Dr. Clive Riviere sent me a young woman of twenty-three with acute disseminated lupus erythematosus, but in whom there were only the signs of bronchitis. Dr. Riviere kindly sent me the subsequent history. The patient was admitted to the Victoria Park Hospital and died from bronchopneumonia. At the necropsy, there were found numerous tuberculous glands in the thorax and abdomen, but there was no active pulmonary disease, the sole lung lesion being a scar at one apex which may have been a healed tuberculous focus. The patient also had rheumatoid arthritis. In a collection made by Jadassohn tuberculosis was the cause of death in only 2 out of 22 fatal cases of the acute type.

It is generally held that lupus erythematosus of the disseminated

type is a tuberculous exanthem (Boeck), and the association of visceral and glandular disease is so common, and the family predisposition so striking, that it is impossible to doubt a causal relation. It is more difficult to believe that all cases of lupus erythematosus discoides are due to tuberculous toxins, and the results of tuberculin injections are not in favour of this view. W. Pick was unable to obtain a general reaction in a series of discoid cases, except where there was evidence of tuberculosis in other organs, and in only one case was a local reaction observed. In 21 cases presenting no clinical evidence of tuberculosis I obtained a positive reaction with Calmette's test in 14 instances; von Pirquet's test gave similar results. Senger has failed to obtain a positive reaction with Moro's tuberculin ointment, and it is rare to find any marked deviation from the normal opsonic index (Bunch). Recently, however, Gougerot has successfully inoculated guinea-pigs with material obtained from cases of lupus erythematosus of the fixed type, verified histologically.

The evidence is conflicting, and for the present it appears best to follow the line taken by Brocq and Radcliffe Crocker that the fixed type of lupus erythematosus is a toxic disease and that the tuberculous toxin is one of the causes. Drs. Galloway and MacLeod have drawn special attention to the relation of lupus erythematosus and erythema multiforme to general toxaemia, and Besnier has described an unusual form of erythrodermia which appeared to be related.

Other Concomitant Conditions.—Acro-asphyxia is common in patients suffering from lupus erythematosus, and a history of chilblains was given by 38 per cent of my patients. Dr. J. J. Pringle has described the association of Raynaud's disease, and I have once seen sclerodactyly.

Determining Causes.—In very rare instances there is evidence that mental or moral shock has been followed by an attack of lupus erythematosus (Perrin, Morris). Local irritation also may start the eruptive process. Sir Malcolm Morris described a case in which a mosquito bite was the determining cause, and Whitehouse has seen the application of a cantharides plaster act in a similar manner. In one of my acute cases fresh areas developed where a poultice had been applied, and I have several times seen the reaction produced by the Finsen light aggravate existing lesions of the more acute type.

**Pathology.**—The disease appears to consist of a special form of inflammation of the skin originating in the vascular network surrounding the sebaceous and sudoriparous glands, sometimes nearer the surface, in and around the follicular orifices. This may lead in the earlier stages to hyperaemia of the vessels of the corium, and to increased secretion of sebaceous matter. The cellular infiltration consists in the main of round cells, but mast cells and plasma cells are also seen. In my acute case there were many mast cells. Giant cells have been described by Audry. As the morbid condition progresses, the new cell-growth around the vessels and in the dermis degenerates, and causes the destruction of all the normal elements of the skin, replacing them by cicatricial tissue. The epidermic cells degenerate, the process extending from

the rete Malpighii outwards. The tubercle bacillus has never been found in the lesions. The exact nature of the morbid process and the precise parts in which it originates are variably described.

**Symptoms.** — Localised or fixed type. The lesions are erythematous and follicular. The erythematous form consists of plane spots of various sizes and shapes, with a dry, smooth, or scaly surface, intersected in some situations by linear furrows, more or less red from hyperaemia, and sometimes from telangiectases (telangiectatic variety of Radcliffe Crocker), and often associated with increased seborrhoeic secretion. The patch is rarely elevated unless the dermis is involved.

Fig. 105.—Lupus erythematosus.

The follicular form presents no visible hyperaemia except at the margins or in the early stages. It begins as reddish-yellow spots, each with a central scale; these fuse into a greyish dry patch, more or less roughened by minute adherent scales, the removal of which exposes the gaping mouths of the sebaceous and sudoriparous follicles. If the sebaceous glands are irritated, the margins of their openings become infiltrated and swollen, and the appearance of acne may be closely simulated.

**Course.**—All forms of lupus erythematosus tend to extend at the margin, and to heal at the centre, leaving a slightly depressed scar and destroying the glands and hairs. In exceptional cases the disease may spread in a series of concentric rings like erythema iris. Its progress is almost invariably chronic and intractable, more so even than lupus vulgaris; yet occasionally it vanishes by spontaneous resolution, and if the stage of destruction has not been reached it may leave little or no trace of its existence.

The site of election is the face, generally the cheeks and bridge of the nose, where the disease forms a butterfly patch shaped like that of rosacea. It usually appears first as an isolated symmetrical lesion on each cheek, but occasionally spreads from a single central area on the

nose. It may also attack the scalp, destroying the hair bulbs, and I have seen two cases in which the scalp was the first part to be affected. The auricles are commonly attacked, and the resulting cicatrix may cause considerable deformity. Next in frequency come the fingers and hands, the disease usually attacking the dorsal surface, rarely the palmar. In some exceptional cases the limbs and trunk are affected.

**Varieties.**—In some instances the amount of scaling is excessive, and massive crusts form. In others the hyperkeratosis is limited to a narrow ring round the slowly extending cicatrix. In the more superficial forms the disease closely resembles a slowly spreading erythema, and the resulting scar is hardly perceptible.

The mucous membranes are affected in a considerable proportion; Dr. T. Smith, working in my clinic, found the association in 28 per cent. The commonest sites are the mucous membrane of the lips, where the scales resemble a layer of collodion which has dried. On the buccal mucosa white patches, not unlike those met with in lichen planus, and bluish-white areas with a red margin are the usual forms. The palate and the mucosa of the nares may be affected. The mucous membrane lesions rarely cause any subjective symptoms and require to be looked for.

*Lupus Erythematosus Disseminatus.*—The acute form occurs almost exclusively in young females, who are the subjects of the chronic discoid form, but occasionally, as Dr. Pernet points out, it may run an acute course from the onset. The eruption begins on the face in the form of a number of pink or lilac spots, which rapidly become confluent and form a butterfly patch across the middle of the face like the chronic variety. The ears and scalp are involved, and symmetrical spots appear on the trunk and extremities. As a rule, the scaling is slight, and at the onset there may be little to distinguish the lesions from those of erythema multiforme. Haemorrhagic areas are figured in the drawing of a case of the late Sir Stephen Mackenzie, and bullous lesions, sometimes containing blood, have been described by Kaposi and others. The patient is gravely ill, and there may be high fever and great prostration. Death occurs in 8 per cent of the cases (Kaposi), the fatal issue being determined by pneumonia, nephritis, meningitis, or septicaemia. (Jadassohn has collected details of the cause of death in 31 acute cases.) In the acute stages albuminuria is common (Sequeira and Balean). Although beginning acutely, some of the cases of disseminated lupus erythematosus may last for years, with acute outbreaks from time to time. A subacute form is also seen, in which the eruption is of the disseminated type, but there are no grave symptoms. In most instances, however, the patient's general health is poor, and though there may be long periods of intermission, recurrence of acute outbreaks is frequent, especially in the cold season of the year.

In the disseminated type mucous membrane lesions similar to those seen in the chronic form occur, and in my fatal case a characteristic lesion was found on one labium majus.

**Complications of Lupus Erythematosus.**—I have several times seen

the arthropathies described in the acute form by Kaposi and by Philippson. Renal complications also occur, in some cases even a fatal nephritis. Pneumonia and septicaemia have also been met with. Squamous-celled carcinoma occasionally develops, as in lupus vulgaris; Dr. Pringle had a case in which there were multiple cancerous lesions. In 143 cases of lupus erythematosus I have only once seen squamous-celled carcinoma, and this occurred in a persistent disseminated case.

**Diagnosis.**—The eruption is usually characterised by its symmetry, by its limitation to the superficial layers of the skin, by its tendency to implicate the orifices of the sebaceous follicles, by its margin extension, and by the destruction of the skin and appendages within the area of the disease. It is, however, as Radcliffe Crocker pointed out, remarkably apt to simulate other affections, such as chronic eczema, psoriasis, acne, papular and tubercular erythema, chilblains, and even lichen planus; in the early stages a diagnosis may be difficult, but as the symptoms progress the characteristics described will become manifest. From lupus vulgaris it is distinguished in the ordinary cases by the later period of onset, by its symmetry, its superficiality, and its tendency to implicate the sebaceous follicles. There is also the absence of the jelly-like nodules, but in the erythematous form of lupus vulgaris (Leloir and Vidal) these are so minute that they cannot be demonstrated without a biopsy. In very rare instances both diseases may be present in the same patient (*vide* p. 474).

**Prognosis.**—Few skin diseases are more rebellious to treatment than lupus erythematosus, for although the past thirty years have added largely to our remedies, the prognosis of any given case remains almost unchanged. Occasionally the disease may vanish without our intervention, or yield slowly to treatment; more rarely, it may assume an acute phase, and even end fatally; but, as a rule, it pursues its course quietly but persistently, and defies our most strenuous efforts. After the lapse of many years there is usually a tendency to spontaneous cure, but it is not rare to see cases which have defied treatment for ten, twenty or more years.

**Treatment.**—As the condition is considered to be caused by toxaemia, it would naturally be expected that better results would be obtained by internal than by local treatment, and a number of remedies have been used, but none can be regarded as certainly curative. Iodoform was given by Besnier, arsenic by Sir J. Hutchinson, phosphorus by Bulkley, iodide of starch by McCall Anderson, and ergotin and quinine by Brocq. The treatment by quinine advocated by J. F. Payne is probably more efficient than most of the other remedies advised. It is given in gradually increasing doses, beginning with two or three grains thrice daily. In combination with the local application of iodine it has been strongly recommended by Holländer, and I have seen great benefit from the combination. Radcliffe Crocker introduced salicin, which appears to have the greatest effect in the erythematous and acute cases. It is given in fifteen-grain doses thrice daily, and is gradually increased till the patient is

taking a dram or a dram and a half a day. Ichthyol in five-grain doses and upwards thrice daily sometimes has an influence on the eruption. It is, however, impossible to promise that any one of these drugs will cure the condition. General treatment should, of course, be directed towards the maintenance of the nutrition of the body and to the relief of the dyspeptic conditions which are so often connected with the disease. Residence in an equable dry climate has several times been followed by a complete disappearance of the lesions in my own experience.

Locally, the affected parts should be protected as far as possible from external irritation. For this purpose the applications of oxide of zinc with glycerin and lead lotion, or the calamine liniment or lotion, may be used with advantage, especially in the early stages of the disease and in the erythematous cases. Where the lesions are covered with scales, salicylic acid is a good local remedy. I have often used it with great advantage in the form of a salicylic acid plaster alone, or one in combination with creosote. The plaster should, if possible, be allowed to remain on for forty-eight hours. A comparatively smooth and healthy-looking surface appears on the removal of the scales, but, unfortunately, relapses are all too common. The pigmentum iodi, applied once daily while the patient is taking quinine internally, has already been mentioned as often of great service. I have also tried painting the parts affected daily for four days with pure cyllin as recommended by Dr. Leslie Roberts. On the detachment of the brownish scab on the fifth day the area is usually quite smooth. Hebra's soft soap treatment is sometimes efficacious. Equal parts of soft soap (B.P.) and spirit are rubbed into the spots, and the resulting inflammatory reaction is often followed by great improvement in the area treated. Carbolic acid, chrysarobin, and mercurials have also been recommended.

The application of the Finsen light is sometimes attended with good results, but they are usually temporary, and in the acute form the irritation of the actinic rays is often followed by an increase in the diseased area. Dr. Norman Walker reports good results from twenty minutes' sittings under the London Hospital modification of the Lortet-Genoud lamp without the use of the compressor. I have never seen benefit from the *x*-ray treatment, unless it has been pushed to such a degree that a telangiectatic scar has resulted.

Linear scarification, followed immediately by the application of a 3 per cent solution of carbolic acid, is of great value (Brocq), and some surgeons have applied the galvanic cautery with success, but the operation must be done with great care. Excision has also been recommended, but I am doubtful if it is really justifiable, as there is so great a tendency to recurrence.

Recently I have seen great improvement, at any rate temporarily, from the application of liquid air and of carbonic-acid snow. The application of the liquid air is momentary, but the carbonic acid must be kept in contact with the lesion for ten to twenty seconds. There is usually some blistering after the application, and the resulting cicatrix is smooth

and supple, but even in the most successful cases recurrences in situ are common.

Bisserie and other French authors speak very highly of the use of the high-frequency electrode. I gave it a prolonged trial, but did not find it superior to the other local measures described above. Cataphoresis of sulphate of copper 2 per cent has also been used with occasional, but usually temporary, benefit.

**Lupus Pernio, Chilblain Lupus** (Hutchinson).—This rare form of disease is sometimes described as a variety of lupus vulgaris, but it appears to be more properly considered in connexion with lupus erythematosus. It is characterised by purplish-red oedematous swellings with ill-defined margins occurring on the nose, auricles, fingers, and hands. In some cases there is considerable infiltration, and on the nose extreme dilatation of the cutaneous capillaries. The colour of the lesions varies with the temperature, becoming of a violet tint in the cold. The central parts often undergo atrophy, leading to small, sometimes scaly, depressions. The condition is exceedingly chronic, but there may be marked remissions in its severity in the summer. In course of time it usually leads to deformity of the ears and nose. In a severe case under my care for several years some relief was obtained by treatment with quinine internally and the application of the Finsen light locally, and the obliteration of the dilated vessels by electrolysis.

J. H. SEQUEIRA.

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## THE ERUPTIONS OF SYPHILIS (SYPHILODERMIA)

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OF THE SECONDARY STAGE.—Granted that a case of primary syphilis be not treated with mercury, the date of the earliest cutaneous manifestation may be put down as, usually, eight to ten weeks after that of infection. I have known it to be as short a time as six to seven weeks; but this is exceptional. On the other hand, many cases occur in which no eruption is detected until three, four, or even more months have elapsed; but these are usually examples of syphilis interfered with by imperfect mercurial treatment. That the early and prolonged administration of mercury may wholly prevent secondary symptoms is now a matter of everyday experience; but whether in untreated syphilis the skin ever escapes, as the mucous membranes certainly do at times, is more doubtful; and the evidence on this point obtained from patients' statements alone is rarely to be trusted.

The five chief forms of syphilitic lesions of the skin are:—(i) erythematous; (ii) papular; (iii) pustular; (iv) tubercular; (v) ulcerative. The earlier the stage at which the eruption occurs the more transitory and superficial it is. But even in the erythematous or macular syphilide there is a certain amount of cell infiltration, as well

as mere patchy congestion of the skin; and this infiltration becomes

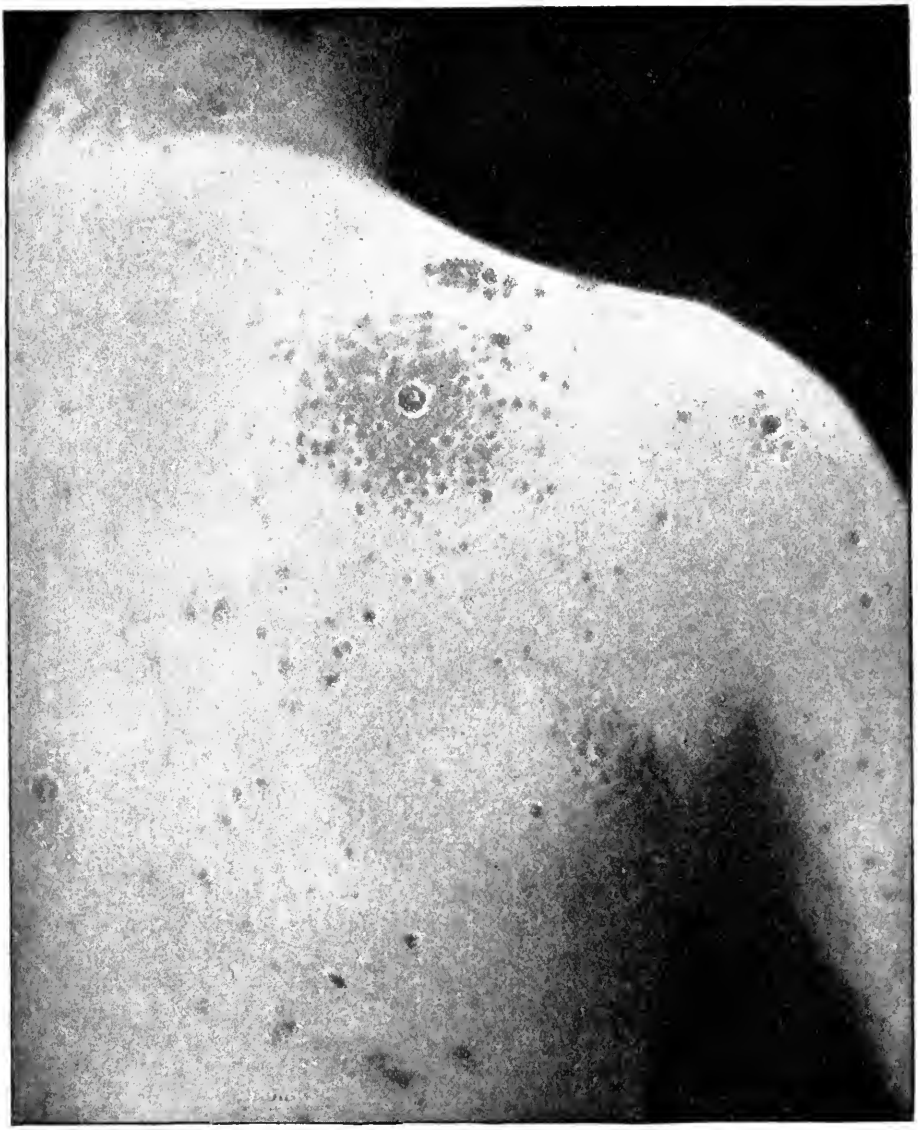

FIG. 106.—The corymbose syphilide; shewing groups of small papules around a large central one, besides many macular stains.

more and more marked in the later stages of the disease, the lesions having then, moreover, a marked tendency to spread, and but little to heal spontaneously. Symmetry, which is fairly pronounced in the dis-

tribution of the early syphilides, is usually absent in that of the later ones. The term "tubercular," used above, refers solely to the gross infiltration of the skin causing raised nodules, and has, of course, no relation to the tubercle bacillus. It is difficult to include all the multiform skin diseases due to syphilis under these five heads, for there are very few non-syphilitic eruptions which it does not imitate. Syphilitic pemphigus, purpura, and the "pigmentary syphilide" are three distinct but rare forms not thus included. The following list will shew the chief resemblances between syphilitic and other skin diseases:—

(*a*) The erythematous syphilide resembles measles, or an erythema

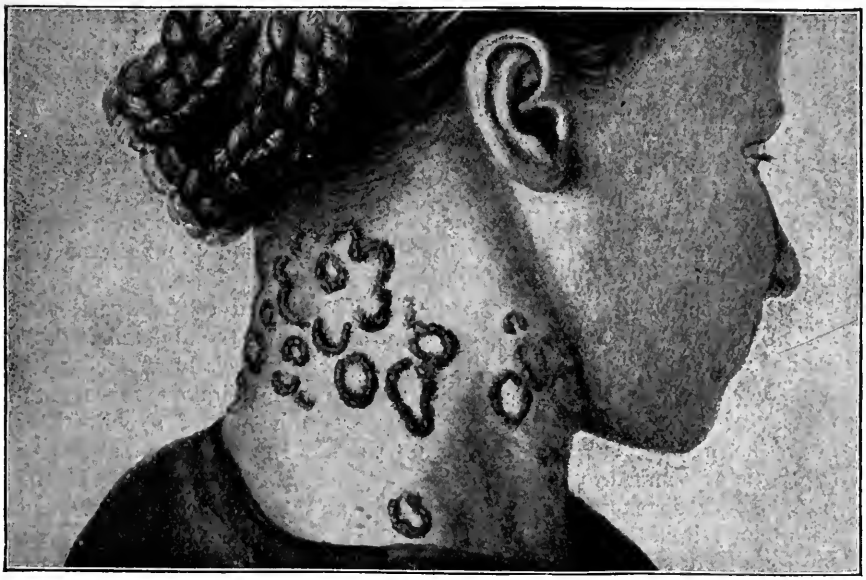

FIG. 107.—The annular or gyrate form of syphilide.

due to certain drugs, etc. (p. 96). (*b*) The papular or papulo-squamous syphilide resembles lichen or lichen psoriasis. (*c*) The pustular syphilide may resemble variola or acne. (*d*) The tubercular syphilide may exactly resemble true lupus. (*e*) Tertiary syphilitic ulcers may be almost indistinguishable from inflammatory or traumatic ulcers, from rodent ulcer, and so forth.

Perhaps the most remarkable imitation by syphilis is the superficial gyrate eruption shewn in Fig. 107, which, without the aid of the microscope, may be impossible of diagnosis from tinea circinata. This tendency to form circles or crescents is a general feature of all but the earliest syphilides—from the annular erythema up to the deep serpiginous ulcers —and is a most important one. Another feature is the polymorphism, or simultaneous occurrence of several distinct lesions; of this the following good instance may be quoted: A man in the fourth month of

syphilis came to me with his chest covered with a macular erythema, his face with a papular and pustular eruption, his thighs with grouped or corymbose papules.

THE EARLY ERUPTIONS.—What form does the earliest secondary manifestation assume on the skin? The following is the result of my observation of a very large number of cases of primary syphilis at the Lock Hospital. In them the earliest eruption was—(i) Papular in 35 per cent; (ii) papulo-erythematous in 22 per cent; (iii) papulo-squamous in 8 per cent; and (iv) erythematous or macular in 35 per cent. Thus the papular form was present, alone or in combination, in 65 per cent of the cases. It is generally stated that an erythema is the most common early eruption, but the figures just given prove this to be a mistake.

The above statements apply, with slight variations, to both acquired and inherited syphilis; and in what follows it will only be necessary to draw attention to certain peculiar features of the latter.

**Localisation.**—As a general rule secondary syphilides affect chiefly the flexor aspects and parts where the skin is thin; to this rule, however, there are many exceptions. Thus, for example, I have frequently seen cases of syphilitic papular or macular eruption almost confined to the extensor aspects of the forearms and arms; and the back of the trunk is commonly as much affected as the anterior surface.

Occasionally the secondary syphilide is confined to one particular region, such as the face; more often to the front of the abdomen. The genital region alone, including the penis, may be especially affected with a papular or other secondary eruption; and peeling, sinuous, raised infiltration of the scrotal skin is a common "reminder" of syphilis long after the general eruption has disappeared. These gyrate patches of syphilitic erythema or papulo-erythema are, owing to the moisture of the part, apt to degenerate into condylomas, and are sometimes attended with much itching and discomfort. There are some remarkable cases of grouping of secondary syphilides immediately around the primary sore, usually in the region of the groin, the rest of the body being practically exempt. To account for this curious limitation it may be suggested that the *Treponema pallidum* is distributed in these cases especially by the lymphatic network radiating from the primary sore.

**Syphilitic erythema or roseola** is usually most marked on the front of the abdomen and chest, and may be but slight in degree; so that in a good number of cases it passes unobserved by the patient. When present it becomes more conspicuous after a hot bath. It may be punctate or confluent; if the former, it may be especially noticeable round the hair bulbs, and the transition of this to a papular lichen is easy. When confluent, it may simulate the mottling due to feeble circulation or to exposure to fire-heat; and in some cases it has a reticular arrangement due, apparently, to the network of small veins in the skin, which strikingly resemble the "cadaveric staining."

As to *duration*, it varies much; as a rule mercurial treatment is promptly resorted to, and the eruption fades away in a week or a fort-

night. But if not treated, though it has a natural tendency to disappear (often leaving macular stains behind), it may persist for some months; or it may pass into other forms of eruption, especially the papular and papulo-squamous. Usually the roseola disappears without desquamation. Microscopical examination has proved that the syphilitic roseola is more than a mere congestive erythema—that a definite exudation of cells is present in the corium, especially around the vessels.

Peeling patches of erythema in the palms, though far from being conclusive evidence of syphilis, are not infrequently due to this disease, especially during the later secondary period—that is, six to twenty-four months, or even more, after contagion. Their bases are usually congested, and they often look as though a vesicle with a red areola round it had burst. Similar peeling patches may be met with on the soles of the feet.

*Diagnosis.*—It occasionally happens that a rash due to copaiba may appear in a patient who is under treatment both for gonorrhoea and for chancres, and doubt may then arise as to its being a syphilide. One of the most distinctive signs is the itching and general irritation of the copaiba rash, a sign conspicuously absent in the syphilide. Another is the grouping of the eruption, copaiba rash being especially prone to affect the forearms and legs, the dorsal surfaces of the hands and feet in large confluent patches; whereas the abdomen and chest, the bends of the elbows, and the inner sides of the thighs are the favourite sites of syphilitic roseola. It is noteworthy that several authors have described the occurrence of an erythema due to mercurial administration; and, supposing the drug to have been given for primary syphilis, one can imagine that the difficulties of diagnosis in such a case must be great. At the same time this mercurial erythema is so rare, in the judicious use of the drug, that many observers in this country with long experience have never seen an undoubted case (*vide also* p. 330).

**Papular Syphilide—Syphilitic Lichen.**—On the back especially this form of eruption may be arranged in lines, running mainly from the spine outwards and downwards, suggesting that the distribution is determined by the spinal nerves. This suggestion, however, is probably fallacious. It may be very thick in the median groove of the back over the spine itself, the papules being of a deep cherry-red colour.

The syphilitic papule consists mainly of a well-defined collection of small cells, in greater abundance around the dilated capillaries, larger multinucleated or giant cells being often found interspersed amongst them. This mass of exudation and proliferating cells flattens out the epithelium and obliterates the papillae, the epidermis becoming shed; hence the summit of the papule is smooth, shiny, and of a deep pink or (later) of a brown colour. The exact nature of the colouring matter is still a matter of doubt; it may persist long after the papule has undergone resolution, leaving in its place a slight depression. The colour is always deeper, or more purple, on the lower limbs than on the trunk and elsewhere. A very frequent and characteristic feature

of the syphilitic papule is a delicate ridge of epidermis all round its margin (sometimes referred to as a "collar") caused by the shedding of the squamous layer over the papule itself. The cellular infiltration in rare cases is mainly grouped around the hair follicles (lichen pilaris); much more often it has no special relation to these structures, or to their glandular appendages, a fact which can be recognised by the naked eye, constituting a marked distinction from the ordinary lichen pilaris. Syphilitic papules vary greatly in size, from small pin-head lesions to nodules half an inch across; or even plaques, like those of lichen ruber planus, may be seen. It is obviously not scientific to divide the eruption into a "larger papular" and a "small papular" variety, since all gradations in size are seen—often on the same patient. It is, however, necessary to notice briefly the curious arrangement which sometimes occurs.

*The Corymbose Syphilide.*—In this form (see Fig. 106) a ring of small papules, perhaps thirty or forty in number, are clustered around a central one which is, as a rule, much larger and more deeply coloured than the others. A clear ring may separate the central and peripheral papules; but this is not invariable. This concentric grouping is best seen on the back and arms, and in certain cases of secondary syphilis is an extremely striking feature. It is an uncommon form; and my belief is that, when present, it indicates a grave attack of the disease, one in which iritis, severe throat lesions, and the like, will probably follow. It is, moreover, slow to yield to mercurial treatment, and hence leaves deep pigmentation behind it. When present it is absolutely indicative of syphilis.

Besides this remarkable form of grouped syphilide, we meet with others which are more difficult to describe. Sometimes the papules are arranged in lines following more or less the natural "cleavage lines" of the skin; at others they may be grouped in curved figures suggesting constellations. I may repeat that there is no proof of the suggestion that syphilitic eruptions are sometimes grouped according to the distribution of sensory nerves.

*The Nodular Syphilide.*—The term "nodule" in this connexion simply implies an exaggerated papule; and there is practically no limit to the size the nodule or plaque may attain. They are usually of a deep brown or copper colour, and, compared with the ordinary papules, are decidedly rare. More common is the *papulo-squamous syphilide* (the so-called syphilitic psoriasis). The latter name is perhaps worthy of retention, since it emphasises its frequent resemblance to common psoriasis. Its chief features will be brought out in the following points of diagnosis:—

| *Papulo-squamous Syphilide.* | *Common Psoriasis.* |
|---|---|
| 1. Occurs mostly on the flexor aspects, or at any rate is not chiefly grouped on the extensor ones. | 1. Affects chiefly the extensor aspects (fronts of knees, backs of elbows, etc.). |
| 2. The scaling is hardly ever free, and may be confined to the edge of the papule. | 2. Copious formation of silvery scales. |
| 3. The colour of the infiltrated papule is usually deeper than in common psoriasis, and the itching less marked. | |
| 4. Yields readily to mercurial treatment, and has little tendency to relapse. | 4. Begins as a rule in early life, and relapses again and again. Is usually relieved by arsenic. |
| 5. If the epidermic scale is removed a smooth surface is exposed. | 5. The surface exposed by removal of the scales is often bright red, and bleeds slightly. |

Like common psoriasis and some cryptogamic diseases of the skin, syphilides often tend to assume an annular or gyrate form (see Fig. 107). This is true of the late erythematous eruption, and still more so of the papulo-squamous; this circinate arrangement is met with in both congenital and acquired syphilis. Almost perfect circles, or segments of circles, which, by joining, may produce figures of eight or three, are sometimes seen. The same form is occasionally met with in the late syphilitic varieties of eruption.

**Condyloma.**—Amongst the most characteristic of all the lesions of syphilis occurring on the skin and mucous membranes are the modified papular elevations known as condylomas. They occur on parts where the skin is thin and constantly moist, or where it is liable to seborrhoea; thus they are most frequently seen around the anus of both sexes, the vulva and inguinal folds of the female, the penis and scrotum of the male. Beneath the pendulous breasts of a woman, at the umbilicus or in the axillae of both sexes, around the oral aperture, on the eyelids and immediately around them, occasionally on the scalp, and sometimes in the external auditory meatus, we meet with condyloma. On the mucous membranes they are seen frequently on the inner surface of the cheeks or on the tongue; and they sometimes spread inward from the anus to the mucous membrane of the rectum (forming the so-called ano-rectal syphiloma). It is with some writers the custom to speak of "mucous patches" as distinct from condyloma of the skin; but no good purpose is served by retaining the former vague name. In their anatomical structure, in the tendency to assume a warty appearance, in the period of syphilis at which they occur, in the contagion of their discharges, the mucous patches agree exactly with condylomas; any differences which may exist being solely due to their situation on a soft mucous membrane instead of on the harder skin. In fact, it is

perfectly correct to speak of condyloma of the laryngeal and pharyngeal mucous membranes; and it is by no means improbable that they may sometimes form in more hidden sites, such as the trachea or oesophagus.

The typical condyloma is a more or less circular flat-topped elevation, moist and slightly granular on the surface, having a broad base of attachment The elevation is due in part to great thickening of the Malpighian or prickle-cell layer (not of the epidermic or horny layer which is frequently thinned or lost), and in part to small-celled infiltration of the corium which accompanies and follows dilatation of the fine blood-vessels and lymphatics. If a condyloma be neglected or badly treated, it shews very little tendency to spontaneous cure; and although it may accompany a general papular eruption, and may be regarded with reason as a modified part of it, yet it will persist for many months after all traces of the latter eruption have faded elsewhere. During the whole period of its existence, so long as there is any discharge or secretion from its surface, there is constant danger of the virus of syphilis being transmitted by its means to other subjects. Thus a woman with vulvar condyloma may convey syphilis to an indefinite number of men; she is a perfect firebrand to the community. A large proportion of the cases of inoculation of syphilis by kissing are due to the presence of condylomas (mucous patches) of the lining membrane of the lips or mouth. Apart from their importance with regard to contagion, condylomas afford one of the least fallible signs in the diagnosis of syphilis; in many cases, indeed, they exist at a period when all other lesions of the secondary stage have practically disappeared.

It must, however, be admitted that (very rarely) raised moist inflammatory patches are seen round the anus, or at other favourite sites for condyloma, which are not syphilitic in origin—these we may call *pseudo-condylomas*. Such patches I have seen between the nates in a case of general psoriasis; and round the anus in two or three children in whom otherwise not the slightest evidence of syphilis could be obtained.

The Late Eruptions.—**Ecthyma.**—Of this it may be said that it usually appears after several months, perhaps a year or two, have elapsed from the date of contagion. It by no means depends necessarily upon a depressed general condition of health, and may manifest itself in young and temperate subjects. It is a troublesome form of eruption, inflamed skin being very liable to further irritation by chafing; and in some cases punched-out ulcers, and ultimately depressed scars, may be produced. The thighs and legs are the most usual site, exact symmetry, however, being quite exceptional. From ordinary ecthyma the syphilitic form is usually to be distinguished by the presence of other typical lesions (nodular, papulo-squamous, etc.) and the deep areola around the scabs.

**Rupia** is one of the most peculiar eruptions of the late secondary stage, closely allied to syphilitic ecthyma. In this the formation of

large vesicles or pustules is followed by the drying of the scab, which is so pushed up by the formation of successive and larger layers that an appearance not unlike that of a limpet shell is produced. If the whole pyramidal crust be removed a superficial circular ulcer is exposed, the central part of which is often found to have healed. The individual lesions are widely scattered, with intervening areas of healthy skin. The extensor surfaces are quite as liable to be affected with rupia as the flexor. Rupia invariably leaves scars, which are usually dotted with depressions, and are commonly white and supple.

**Bullous Eruption.—Syphilitic Pemphigus.**—In acquired syphilis any eruption which can fairly be called pemphigus is excessively rare. The limpet-shell crusts of rupia are sometimes preceded by large vesicles, but the latter have only a short duration. Sometimes, however, bullae form the prominent lesions on the skin and persist as such. Two remarkable examples are recorded by Sir J. Hutchinson, coming on during the sixth and tenth months respectively of acquired syphilis. In each the patient was extremely ill, but eventually recovered under the administration of arsenic and mercury. In each there was a suspicion that iodide of potassium might have been the cause of the pemphigus, and a certainty that it made it worse; but other forms of cutaneous syphilis were present at the same time. In the subjects of congenital syphilis pemphigus is more common, particularly on the extremities; and the infants may be born with the bullous eruption out on them. Although admitted by every one to indicate a very grave prognosis as regards the life of the child, some patients recover under the judicious use of mercury and other appropriate remedies.

**Squamous and crustaceous syphilides** appear to form by far the commonest secondary eruption met with on the hairy scalp. This is partly due to the difficulty of recognising such eruptions as macules in this region, but still more because seborrhoea (which is extremely common on the scalp and forehead) modifies the syphilitic eruption, causing the formation of flakes or crusts which conceal the papular element. Thus it often happens that the syphilitic eruption, which is papular or roseolar on the rest of the body, is crustaceous on the scalp. Where the hairy scalp and forehead meet, a band of large and often confluent papules is prone to form, and, as in the scalp, to be modified by the seborrhoeic process. To it the name "corona Veneris" is sometimes applied, though this name is of wide interpretation, and has been used in respect of almost any form of syphilis occurring in this position.

**The tubercular syphilide, or syphilitic lupus,** must be noticed here, as it may occur within two years from infection. Indeed, in cases of so-called "precocious malign" syphilis this form of skin disease may, like rupia or even gumma of the skin, form an important symptom during the first eighteen months, though fortunately such cases are rare.

Although of course by the terms "tubercular" and "lupus" some relation to the effects of the tubercle bacillus is often implied, and hence

they cannot always be strictly justified when speaking of syphilitic skin lesions, they have become consecrated by use, and there is a certain convenience in using them to emphasise the extraordinary resemblance which exists between true lupus and its syphilitic imitation. In both there is a slowly spreading infiltration of the skin, which tends to scab over and to ulcerate; in both, the face is more frequently attacked than any other part of the body, and in both there is a tendency to heal in one part whilst spreading in another. Just as lupus erythematosus is prone to occur in the "bat's wing" form over the nose and both cheeks, so syphilitic lupus may be confined to the same regions with almost the same exact symmetry; of this I have seen many examples. It may be noted that the tubercular syphilide is more often multiple, that is, occurring in many isolated patches, than true lupus; the destruction of tissue is, however, more rapid in the first form, and the scars left by the two diseases differ considerably. Those due to ordinary lupus are apt to be thick, congested, and prone to break down; whilst those resulting from the healing of syphilitic ulceration are white, supple, parchment-like, and sound. Further, syphilitic lupus, or spreading tubercular infiltration, often attacks the skin around joints, such for instance as the knees, the shoulders, and the elbows; and one of its frequent sites is the dorsal region of the trunk—for instance, the lumbo-sacral area, where true lupus is very seldom seen. But the resemblance between the two is very close; and nothing but a careful inquiry into the history, the discovery of other symptoms, a positive Wassermann reaction, and the result of treatment, may suffice to decide the diagnosis (see also p. 474).

Diagnosis of Syphilides.—It is hardly necessary to point out that in any doubtful case a thorough examination should be made for the presence of symptoms other than the eruption. Perhaps the most important region to inspect is the throat. Many a time the discovery of superficial white ulcers on the tonsils, pillars of the fauces, tongue, or mucous membrane of the lips will settle the diagnosis; though it must be admitted that a considerable proportion of sufferers from secondary syphilis (probably 20 per cent) escape any obvious lesions of the mucous membranes. Another part from which confirmatory evidence is likely to be obtained is the anus, where condylomas are so apt to occur, and are so pathognomonic.

Amongst the many forms of skin disease which may coexist with secondary syphilides on a patient may be mentioned (i) scabies, (ii) tinea versicolor, (iii) psoriasis.

The diagnosis is obviously rendered more difficult when two separate lesions of the skin coincide—one syphilitic and the other non-syphilitic. In one case an infant was brought to me with obvious lesions of secondary syphilis around the anus, in the mouth, and so on; and with a general eruption which was in parts very pruriginous. It proved to be a mixture of a syphilitic lichen and scabies; and on examination of the mother (who was suckling her child) it was found that she also had

scabies, especially marked on and around the breasts, but no sign of secondary syphilis. The husband had apparently been the source of contagion in both diseases (see also p. 679).

The *Treponema pallidum* should be searched for in any doubtful case. It may be found by an expert microscopist using the dark-ground condenser in many cases of secondary eruption—particularly the papules or condylomatous form. In erythematous eruptions it is almost impossible to find the organism.

THE TREATMENT OF SYPHILITIC SKIN DISEASE.—In the great majority of cases this consists solely in the prolonged administration of mercury. If a very rapid effect be desired, resort may be had to hypodermic injection of mercurial compounds, of which the number is legion. The insoluble are as a rule preferred. The two most widely used are the grey oil and calomel suspended in olive oil. The grey oil should have the following composition:—Mercury one part, lanoline four parts, liquid paraffin five parts. Thus its strength is one in ten, and ten minims form a suitable dose. The calomel preparation is also in the strength of one grain to ten minims of sterilised olive oil. As a rule these injections are made, with full antiseptic precautions, deeply into the muscular tissues of the buttock. Whilst the exact value of these methods is still uncertain, it may be positively affirmed that they are to a great extent unnecessary and irksome to the patient, and that the careful administration of mercury by the mouth is in many cases to be preferred. The details with regard to this are given on p. 368, Vol. II. Part I. In treating cases of the more severe forms of eruption, such as ecthyma and syphilitic lupus, it may be necessary to combine iodides with the mercury. The striking effects of hypodermic injection of dioxydiamido-arsenobenzol or salvarsan on the various cutaneous manifestations of syphilis are now accumulating. As regards local treatment none is required in the early and slight forms of eruption; but the inunction of an ointment of oleate of mercury (5 or 10 per cent) certainly hastens the disappearance of the syphilitic papules, nodules, and the rest. The treatment of condyloma requires strict cleanliness, and the use of a dusting powder containing one part of calomel to two or three of oxide of zinc. Rupial sores heal well under the application of an ointment containing the red or yellow oxide of mercury, 5 to 10 grains to the ounce. Occasionally the application of acid nitrate of mercury, or the actual cautery, may be required in obstinate cases of syphilitic lupus. It should be remembered in any very persistent or obstinate case of syphilitic disease of the skin that residence at the seaside may greatly help the action of remedies, and also that *x*-rays, though not usually effective, may now and then also assist the case.

J. HUTCHINSON.

YAWS—*vide* art. Vol. II. Part II. pp. 695-703.

LEPROSY—*vide* art. Vol. II. Part II. pp. 648-694.

VERRUGA—*vide* art. Vol. II. Part II. pp. 704-708.

ULCERATING GRANULOMA OF THE PUDENDA—*vide* art. Vol. II. Part II. pp. 708-712.

ORIENTAL SORE—*vide* art. Vol. II. Part II. pp. 712-722.

## BLASTOMYCOSIS

By H. G. Adamson, M.D., F.R.C.P.

**Introduction.**—Blastomycosis is a disease due to the invasion of the body by yeast organisms. It occurs in two main clinical forms, known respectively as cutaneous blastomycosis and systemic blastomycosis. In cutaneous blastomycosis, which is a very chronic malady, the lesions are confined to the skin and bear a strong resemblance, both clinically and histologically, to the verrucose type of lupus vulgaris. In systemic blastomycosis there are multiple abscesses, cutaneous and deep-seated, with accompanying symptoms resembling those of visceral tuberculosis or of chronic pyaemia, and generally a fatal termination. Except for a few examples of blastomycosis reported in Europe, all the cases have occurred in the United States and in Canada. A few cases described as "protozoan infection" or "coccidioidal pseudo-tuberculosis," mostly in South America, are now thought to be closely allied to, if not identical with, systemic blastomycosis.

**History.**—Occasional observations and experiments made during the latter half of the nineteenth century had suggested that yeast organisms and nearly related forms might be pathogenetic for animals, but the attention of medical men was more particularly directed to this subject by the publication, in 1894, of 2 cases of human infection by yeast organisms. In that year Gilchrist, of Chicago, demonstrated before the American Dermatological Association in Washington certain vegetable organisms in the tissues of a case of supposed scrofulodermia. A few months later a case was published by Busse, in Germany, in which apparently similar bodies were discovered, and for which he proposed the name "Saccharomycosis hominis." Shortly afterwards several Italian workers (Sanfelice, Maffucci and Sirleo) clearly demonstrated that yeast

fungi could be pathogenetic in animals, and Curtis, in 1896, in France, obtained successful results by inoculation of animals with yeast organisms from "myxomatous" tumours in a man. In the same year (1896) Gilchrist published his classical paper on "A case of Blastomycetic Dermatitis in Man," in which he accurately described the parasite and illustrated by plates its relation to the lesions in which it was found. In 1898 Gilchrist and Stokes gave an account of their inoculation experiments in animals, and Wells, Buschke (in Germany), and Hessler recorded fresh cases. In 1899 Hyde, Hektoen, and Bevan published an important paper founded upon 7 cases (5 already published and 2 new ones), and also pointed out the value of iodide of potassium in the treatment of this affection. Since then many other cases have been reported, by Brayton, Gilchrist, Wells, Stelwagon, Hyde and Ricketts, Montgomery and Ricketts, Dubreuilh, and others, and in 1910 some 100 cases had been recorded These cases have occurred chiefly in and around Chicago, some in other parts of the United States and in Canada, and a few on the Continent of Europe, but no authentic case has been reported in this country.

The knowledge of *Cutaneous blastomycosis* was well summarised by Gilchrist (6) in 1902, in which year he demonstrated his specimens and photographs before the British Medical Association in Manchester; F. H. Montgomery also, in 1902, wrote an article, profusely illustrated, dealing with this subject. At the time when these papers were published, of the 32 cases then recorded, in some 3 or 4 a systemic infection had occurred. Besides the cases of Busse, in Germany, and of Curtis, in France, which were now regarded as examples of blastomycosis, and which were both systemic, F. H. Montgomery and Walker (15) observed a case of cutaneous blastomycosis in which death had taken place from supposed generalised tuberculosis, but which, on microscopical examination of the visceral lesions five years later, proved to be systemic blastomycosis. A fourth case was one of Gilchrist's. When it was recognised that the infection might become systemic, interest in the disease began to deepen, but it was still regarded as being mainly a cutaneous infection, and systemic infection exceptional. From this time forward occasional examples of *systemic blastomycosis* were published, by Ormsby and Miller (1903), Cleary (1904), Eisendrath and Ormsby (1905). Then, in 1906-7, as many as 7 cases were recorded, by Bassoe, Irons and Graham, Christensen and Hektoen, Coley and Tracey, Herrick and Garvey, F. H. Montgomery. In 1908 F. H. Montgomery and Ormsby published an exhaustive paper on systemic blastomycosis, containing a summary of 22 cases (7 previously unpublished), 13 of which occurred in Chicago, 7 in other parts of the United States or in Canada, and 2 only (Busse, Curtis) in Europe.

Thus far I have briefly given the history and literature of cutaneous and of systemic blastomycosis. It will now be necessary to retrace our steps in order to follow the course of "coccidioidal or protozoan dermatitis" from the first description down to the time when it was

recognised as probably identical with systemic blastomycosis. Gilchrist, in the volume of the Johns Hopkins Hospital Reports which contained his account of blastomycetic dermatitis, also published, with Rixford, a paper entitled "Two Cases of Protozoan (coccidioidal) Infection of the Skin and other Organs." Both cases ended fatally. The organisms found in the lesions differed from blastomycetes in that they developed by sporulation, whilst the latter multiplied by gemmation. In this paper Gilchrist also pointed out that Wernicke had in 1892 published a similar case, in which he had described sporozoa in lesions which he mistook for mycosis fungoides. Following Gilchrist's paper, Posados in 1897, Ophüls and Moffit in 1900, and D. W. Montgomery in 1900, recorded similar cases of protozoan or coccidial disease. In 1902 Gilchrist and others suggested that coccidiodal disease might be a form of systemic blastomycosis, but D. W. Montgomery (1903-4) still contended against their identity. H. F. Montgomery and Ormsby, and Hektoen have recently discussed the matter fully, and have concluded that the two affections are closely related if not identical.

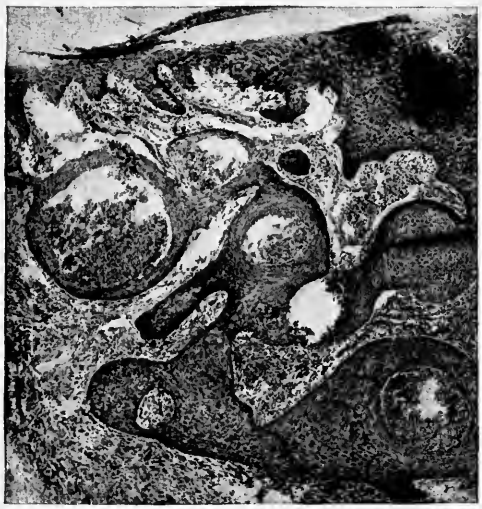

FIG. 108.—Section under a low power shewing the characteristic histological structure of the lesions. The epithelial hyperplasia and the miliary abscesses are conspicuous. (Reproduced from an article on "Cutaneous Blastomycosis," by permission of the late Dr. J. Nevins Hyde, of Chicago.)

**Etiology.**—There can be but little doubt that the disease is due to infection by the blastomycetes or yeast fungi which are found in the lesions. This is the most important factor in the etiology. No predisposing causes have been recognised, except that patients have, as a rule, been situated in unfavourable hygienic surroundings. Males have been affected in a larger proportion than females. The ages of the patients have ranged between seventeen years and fifty-eight years. In cutaneous blastomycosis there has sometimes been a history of slight abrasion or trauma preceding the local lesion. Systemic infection is believed to take place mainly through the lungs. The exact significance of the geographical distribution of the cases is not apparent.

**Morbid Anatomy.**—The lesions both of cutaneous and of systemic blastomycosis are of the nature of granulomas. In those of *cutaneous blastomycosis* there is a dense cell-infiltration of the corium, together with a marked proliferation of the epidermis in the form of large irregular

prolongations into the corium. The epithelial prolongations are peculiar in that they contain minute abscesses in which the parasites are sometimes observed. The cell-infiltration in the corium recalls that of tuberculosis, and is made up of plasma cells, epithelioid cells, and, usually, large or small giant cells. In the corium are also collections of leucocytes constituting microscopic and miliary abscesses. The parasites are found scattered among the cells of the infiltration, in the minute abscesses, or in the giant cells (Figs. 109, 110). The number of organisms in one section may vary from two or three to half a dozen, some may shew more, others none. They occur as rounded bodies, from 7 to 20 $\mu$ in diameter, with clear, finely or coarsely granular contents, one or more vacuoles, and a highly refractive doubly-contoured capsule. They are seen in pairs of unequal size, singly, or sometimes in small groups. They often present distinct buds. They are readily seen in sections stained by all ordinary methods and do not require any special procedure for their demonstration.

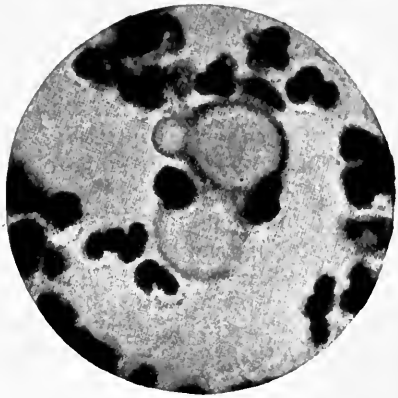

FIG. 109.—Photomicrograph shewing budding organisms in the tissue. × 1200. (J. Nevins Hyde.)

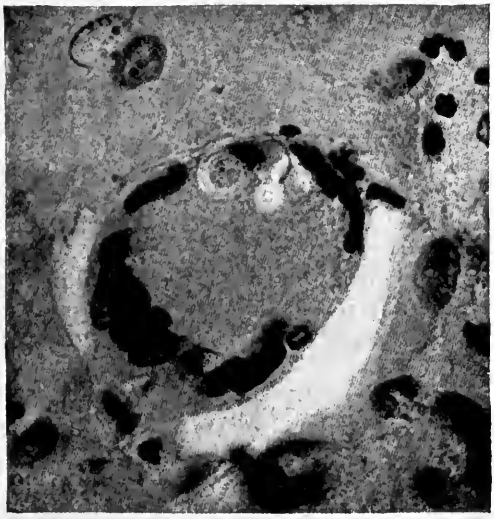

FIG. 110.—Giant cell containing a group of organisms. × 600. (J. Nevins Hyde.)

In *systemic blastomycosis* the gross morbid anatomy somewhat resembles that of tuberculosis, but there is a special tendency to the formation of multiple abscesses in all parts of the body and viscera, and especially subcutaneously. The abscesses may be microscopic or large enough to hold a litre of pus. They may burrow deeply in the muscles or bones, produce large thoracic, pelvic, or abdominal abscesses, or multiple abscesses in the lungs, spleen, or other organs. The histological appearances also suggest

tuberculosis, but differ in the greater abundance of polymorphonuclear leucocytes, or, in other words, in their tendency to abscess formation. In the visceral lesions the organisms are found in abundance, often in considerable masses, and they are always more numerous there than in the lesions of the skin. Budding forms are seen, but only in 2 cases has there been any suggestion of spore formation, a process which, as has already been said, is a characteristic feature of the probably closely related "coccidioidal" infections.

**Pathology.**—There is good reason to believe that the organisms found in these lesions are pathogenetic; they may be readily obtained in pure culture from the pus, and, although animal inoculations have not been uniformly successful, the disease has repeatedly been reproduced in animals, and pure cultures have again been obtained from the lesions so produced. Moreover, as will be seen, the clinical features of the disease and the characters of the lesions are distinctive, and, further, there is the constant relation of the organism with the characteristic pathological changes. Tuberculosis, the disease which is most closely imitated, has been excluded by failure of inoculated tissue to produce tuberculosis in guinea-pigs, by negative tuberculin reactions, and by the marked effect of the administration of iodide of potassium.

*The organism* must be distinguished from the so-called pseudo-psorosperms, which are found in various affections, such as Darier's disease, Paget's disease, and herpes zoster, which are the result of cell-degenerations, and which actually bear little resemblance to blastomycetes (4). Its appearance in sections has already been described (p. 519). It is said to be readily demonstrated in pus by placing a drop of the latter upon a slide with liquor potassae, or even with water, pressing down with a cover-slip and examining under the microscope, when the double-contoured budding refractive bodies are easily recognisable. Mycelium is not seen in the tissues, but forms in hanging-drop cultures and in cultures on solid media. The organism has been classed by various observers among the yeasts and the oidia.

Cultures.—Pure cultures of the organism are readily obtained in all ordinary media by inoculation from the miliary abscesses in cutaneous blastomycosis or from unbroken abscesses in systemic cases, the growth appearing in from two to fourteen days. The appearances of the cultures vary much according to the medium used, the temperature, and the amount of moisture. They may be moist and pasty, dry and downy, or with a granular surface and white or light brown in colour. It is probable that the different appearances correspond in great measure to different varieties, as in the case of the ringworm fungus, but this is a matter which still awaits more careful study. It is possible that in many instances there may be two or more varieties of blastomycetes present in one case, for, as Hansen has shewn, yeasts rarely occur singly.

Microscopically cultures shew a mycelium with bud-like projections and often containing spore-like bodies, and also budding forms like those seen in the tissues or in pus.

Animal inoculations have by no means been invariably successful, but positive results have been obtained by Gilchrist and Stokes, Curtis, Hyde and F. H. Montgomery, Hyde and Ricketts, Ormsby and Miller, and Coley and Tracey. The best results have followed intraperitoneal and intravenous injections of pure cultures; and they were most marked in animals killed about three weeks after inoculation, for guinea-pigs in which a general systemic infection was indicated by irregular fever and by the formation of abdominal tumours have eventually made a complete recovery. The lesions found in animals were similar to those in man. A noteworthy feature was the marked involvement of the testicles. The organism was recovered in cultures from the lesions.

**Clinical Features.**—In cutaneous blastomycosis the lesion begins as a small papule or nodule which extends peripherally and becomes covered with a crust, on removal of which a warty or papillomatous

FIG. 111.—Characteristic lesion of cutaneous blastomycosis. This illustration also shews metastatic lesions. (By permission of the late Dr. J. Nevins Hyde [Dr. Walker's photograph].)

surface is exposed. Generally the patient is not seen until the affection is of some weeks' or months' duration, and the lesion has attained a diameter of half an inch or more. It then appears as a raised circumscribed patch, with a dull-red infiltrated margin which encloses an area made up of closely set papilliform elevations separated by clefts or fissures (Figs. 111 and 112). From between the papilliform elevations purulent secretion may be squeezed out. If untreated, the lesion may slowly extend until it reaches the size of the palm, or even much larger. As the disease spreads, slowly or intermittently, over months or years, healing may take place at parts, with the formation of smooth, pinkish-white, elevated, scar-like patches amongst the papilliform growth. The size and character of the papilliform elevations vary in different cases according as the lesion is small and has been kept clean, or is large and neglected. In the former case they may be dry and verrucose, in the latter large and fleshy. The margin of the lesion is described as one of its most characteristic features. It is dull-red or purple in

colour, slopes downwards from the elevated warty surface towards the normal skin, from which it is sharply marked off, and, on close inspection, is seen to be studded with numerous miliary abscesses, often only recognisable by the aid of a magnifying glass. Although the organism may be found in the pus squeezed out from the spaces between the papilliform elevations, it is most readily discovered in the muco-purulent contents of these minute abscesses, from which it can be obtained in pure culture.

The lesions are usually free from pain or tenderness, but may become tender when contaminated by pyogenetic organisms and inflamed. The regions most commonly affected are the face, the backs of the hands, or the legs. The lesion may remain single, or new foci may form apparently by auto-inoculation of adjacent or other regions of the body. A common history is that a second lesion appeared within a month or two of the appearance of the first. Usually glandular enlargement is absent, even with very large lesions. The general health is undisturbed, the temperature normal, and there is no cachexia. In a few instances the infection has attacked internal organs after first beginning in the skin, and these exceptional cases are interesting as connecting links between the cutaneous and systemic types. The course of disease is chronic, cases having lasted from three to twenty years before receiving appropriate treatment.

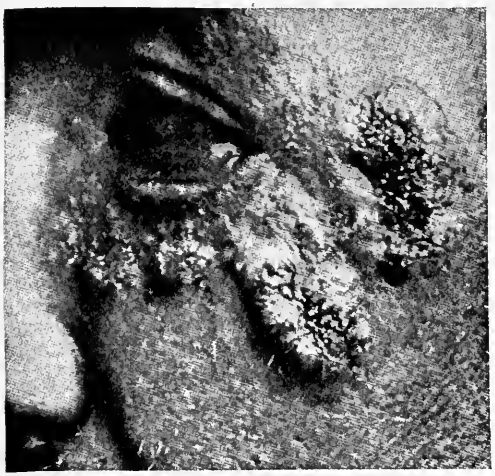

Fig. 112.—Characteristic lesion of cutaneous blastomycosis. (J. Nevins Hyde.)

*Systemic blastomycosis* is characterised by the occurrence of multiple abscesses in various parts of the body in association with symptoms of chronic pyaemia, or with symptoms resembling those of tuberculosis of the lungs or kidneys. These cases usually run a chronic course, with irregular temperature, night sweats, and emaciation. The abscesses are of two types, superficial and deep. The superficial appear in crops, as pear-sized or larger nodules which soften and rupture to form fistulas or ulcers. Some of these may fungate and become papillomatous with the characteristic red border containing miliary abscesses as in cutaneous blastomycosis. The deeper abscesses are larger but less numerous, and may appear as a psoas, perinephric, abdominal, or other abscess. Some-

times the joints are affected, suggesting the diagnosis of rheumatism. There may be general glandular enlargement, but usually this is not a prominent feature.

It is believed that in these cases infection takes place through the lungs, and, as already stated, generalisation secondary to cutaneous blastomycosis is rare. Blastomycetes may be found in the sputum, in the faeces, or in the urine. Usually the physical signs in the lungs and elsewhere, and the accompanying symptoms are very much less than would be expected from the changes found after death.

In *coccidial dermatitis* the symptoms closely resemble those of blastomycosis, namely those of a chronic pyaemic infection with multiple abscesses in the skin and all parts of the body, differing only in that the course of the disease towards a fatal termination is usually more rapid. Extension by the lymphatic channels is more common, possibly because the organism in coccidial disease is reproduced by spore formation and not by budding as in blastomycosis.

**Diagnosis.**—The impression gained by reading the accounts of these cases, and, above all, from study of the numerous excellent photographs published in America, is that diagnosis is not difficult, for the clinical features appear to be extremely constant and characteristic. Moreover, the organism, from its size, is not readily overlooked either in preparations of the pus or in sections, and it is obtained without difficulty in culture. When the organism is not found in smears or sections, or in culture, a suspected case is probably not one of blastomycosis. In the case reported by Dr. J. H. Sequeira, and in those of Löwenbach and Oppenheim, of Brandweiner, and of Finger in Austria, the evidence is incomplete. In the Austrian cases the lesions, which attacked the nose and the neighbouring parts of the cheeks, suggest syphilis or folliculitis ulcerans serpiginosa nasi; for in three instances there was perforation of the nasal septum. In Brandweiner's case, the organisms figured resemble the bottle bacillus (*vide* p. 8).

The affections for which cutaneous blastomycosis is most likely to be mistaken are lupus verrucosus, papilliform syphilide, and carcinoma. In lupus verrucosus the lesions are usually less rapid in development, and, although blastomycosis may last many years, the lesions reach a much larger size than do those of lupus verrucosus. Lupus verrucosus is less often multiple and is very rare on the face. The papilliform growth is drier and more warty, and the miliary abscesses of the border are absent. Doubt may be settled by the presence or absence of the yeast organisms, the positive or negative reaction to tuberculin, and by the behaviour of the lesion on administration of iodide of potassium in large doses.

From late syphilitic eruptions blastomycosis is distinguished by the long persistence and attainment of large size without ulceration; by the absence of the grouping of individual nodules to form a large patch so characteristic of late syphilis; by failure to react to mercury; and probably (though this has not been verified) by a negative result in Wassermann's test.

In squamous-called carcinoma the base of the lesion is harder, and glandular enlargement is generally present, whilst there is no evidence of spontaneous healing in parts.

In all cases of doubt the diagnosis may be usually settled at once by the finding or not of blastomycetes in the pus or excised lesions, since these are so easily demonstrated if present.

*Systemic blastomycosis* is most likely to be mistaken for pyaemia, tuberculosis, syphilis, nephritis, or articular rheumatism; but when the abscesses or cutaneous lesions are present the diagnosis is easily settled by examination of pus or tissue. When systemic symptoms arise first, pulmonary, gastric, or renal affections may be simulated. Blastomycetes in the sputum will settle the diagnosis.

**Treatment.**—Nearly all the cases of cutaneous blastomycosis treated by iodide of potassium have improved, and in many recovery has been complete. These results, however, have been obtained only by perseverance with large doses, even up to 200 to 500 gr. a day. In some cases excision has been successful, but scraping has not prevented a return of the disease. As would be expected, *x*-ray applications also remove cutaneous lesions. The treatment very commonly adopted in America is by iodide of potassium internally, with local *x*-ray applications to complete the cure. In systemic blastomycosis administration of iodide of potassium has not met with such success, but F. H. Montgomery considers that if the diagnosis were made early, large doses of potassium iodide given, and the patient removed from unhealthy surroundings, possibly also with a change of climate, better results might be anticipated.

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H. G. A.

# SPOROTRICHOSIS

By H. G. Adamson, M.D., F.R.C.P.

**History.**—The recognition of sporotrichial infections of the skin is of relatively recent date. The first case was reported in America by Schenk in 1898 as "Refractory subcutaneous abscesses caused by a fungus possibly related to sporotricha"; and in 1900 a similar case was published by Hekteon and Perkins, also in America. In both these cases the infection had started in the index finger, and had led to a series of subcutaneous abscesses, connected by a chain of chronic lymphangitis, along the arm. A striking feature of these abscesses was their obstinacy to ordinary methods of surgical treatment. A new form of pathogenetic fungus was obtained by culture from the lesions, the *Sporothrix schenkii.* It was not until 1906 that attention was again drawn to this affection by an important paper by de Beurmann and Gougerot, who studied human sporotrichoses in general, the cultural and morphological features of its parasite, and the clinical form which they called the "syphiloid type." In the French cases there were multiple, widely distributed, gummatous lesions. De Beurmann here reported four new examples of sporotrichosis, one of which he had previously published in 1903 as a case of multiple subcutaneous abscesses of mycotic origin. He also referred to the two American cases, and to a third by Brayton, probably of the same nature (in a florist), in which a wound of the forefinger was followed by a chain of chronic abscesses along the arm. A case of Lesné and Monier-Vinard (1906) had also proved to be a sporotrichial infection, and Dor (1906) had recorded a case in which the abscesses were large and healed readily after surgical interference, but had yielded a sporothrix. The publication of de Beurmann and Gougerot's paper was followed by a series of cases by Gaucher and Monier-Vinard, Duval and Fage, Vaquez, Laubry and Esmein, and Bonnet. During 1907 de Beurmann and Gougerot published numerous papers recording fresh cases and dealing with the clinical, histological, and cultural features of the affection. In November 1907 these observers described what they called the "tuberculoid type," and gave an exhaustive study of the morbid anatomy of the lesions. In 1908 the publication of new cases in France continued, and 6 examples were recorded from South America. In 1909 Bruno Bloch observed a case in Bâle, and published an account of it. This was an acute case with febrile symptoms, disseminated cutaneous lesions, and also a sporotrichial osteitis of the sternum and of the clavicle. Bloch reviewed the whole subject, and his monograph has been characterised by de Beurmann as the best and most concise didactic résumé at the present time. Other cases have been since observed by Stein in Berne, in Jadassohn's

clinic ; by Lerat in Brussels ; by Dubois in Geneva. These latter cases are all referred to by de Beurmann and Gougerot in a paper on "The 100th Case of Sporotrichosis". (4). The first case in Germany was reported by Arndt in 1910. Further knowledge of this disease has shewn that sporotrichosis affects not only the skin and subcutaneous tissues, but also mucous membranes, and that intramuscular and periosteal gummas and even pulmonary abscesses may be caused by the presence of the sporothrix. Widal and André have isolated the parasite from the blood of a patient with cutaneous sporotrichosis.

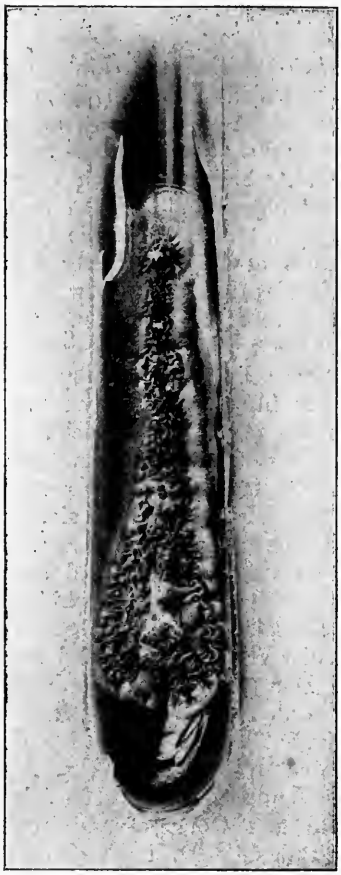

Fig. 113—Culture of *Sporothrix beurmanni* on Sabouraud's maltose agar. (Sabouraud.)

**The Fungus.**—*Sporothrix beurmanni* (the *Sporothrix schenkii* is probably a different variety). The presence of the fungus is only rarely and with difficulty demonstrated in the lesions, but when found it is seen as short or oblong rods, 2-5 × 1-3 $\mu$, granular, basophil, then oxyphil (degeneration stage), surrounded by an uncoloured areola. The fungus may be free or in phagocytes. On the other hand, cultures are readily obtained on most of the ordinary media, the most suitable being Sabouraud's peptone - glucose - agar (peptone Chassaing 1, crude glucose 3·7, agar 1·5, water 100). The fungus grows best at the room temperature and with the tubes not capped. Colonies appear on the fourth to the sixth day as small white acuminate points 1 mm. in diameter, surrounded by a white areola finely rayed. They slowly increase in size and become convoluted and brown in colour (Fig. 113).

Films from cultures shew long filaments, 2 $\mu$ broad, together with numerous ovoid spores 5-6 $\mu$ in length by 3-4 $\mu$ broad. Here and there single spores or bunches of thirty to forty are seen attached to the mycelial filament by a short pedicle (Fig. 114).

*Saprophytism of Sporothrix beurmanni.*—The saprophytic nature of the fungus has been demonstrated by its culture upon various animal structures (caterpillars, flies, and larvae) and upon vegetables (lettuce leaves), and it has been suggested that infection may take place by contact with unclean vegetables, or from the same source by the alimentary canal.

*Experimental Sporotrichosis in Animals.*—De Beurmann produced a generalised subcutaneous gummatous sporotrichosis in a new-born guinea-pig by feeding it upon milk containing the parasite. Sporotrichosis has been produced in the cat, the mouse, the monkey, and the rat by subcutaneous or by intraperitoneal inoculation. The guinea-pig is the least susceptible animal, the results of inoculation being nearly always negative. In the cat, the monkey, and the mouse the results are more often positive, but inconstant. The rat is very highly susceptible. De Beurmann has

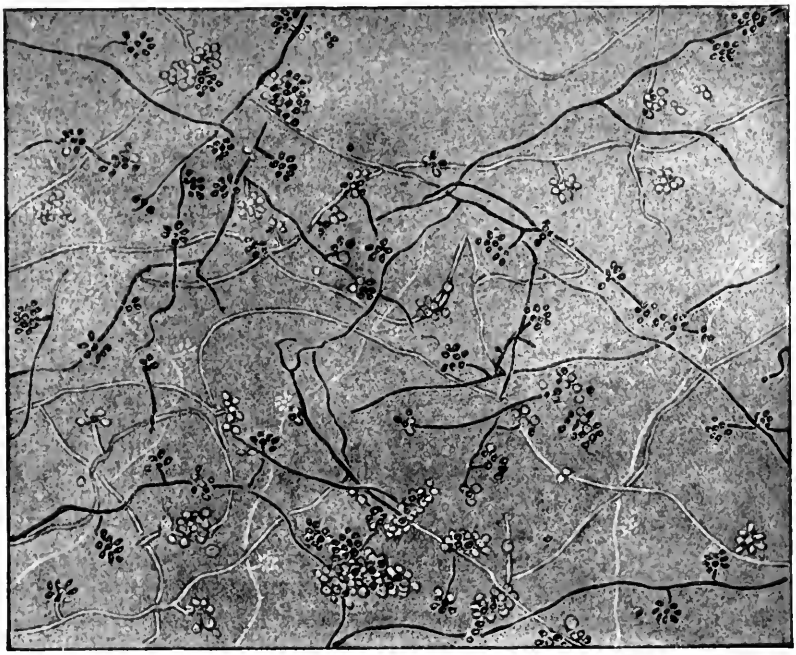

Fig 114. Hanging-drop culture on maltose broth. Five days. × 400 diameters. (From a drawing kindly lent by Dr. Sabouraud.)

made a complete study of artificial sporotrichosis in the rat, which confirms all his anatomo-pathological observations in human sporotrichosis, and adds a whole series of visceral reactions as yet unknown in human beings—hepatitis, pneumonia, arthritis, nephritis, and the like. The parasite is found in great abundance in the lesions of rat sporotrichosis both in the giant cells and in other types of lesions.

*Spontaneous Animal Sporotrichosis.*—Lutz and Splendore, of Brazil, have described spontaneous sporotrichosis in the rat due to *Sporothrix beurmanni*. Sporotrichosis has also been observed in the mule (Fonteynot and Carougean in Madagascar in a series of cases which had previously been regarded as unusual clinical forms of epizootic lymphangitis or glanders), and in the dog (Gougerot and Caraven—in three puppies in

one litter). These observations suggested the possibility that the disease in man is due to contagion from animals, and Carougean has (November 1909) reported a case of sporotrichosis in a veterinary surgeon who had pricked his finger while opening an abscess in a mule with sporotrichosis. J. N. Hyde and D. J. Davis (1910) recorded a case of sporotrichosis in a man who worked near a farm, in North Dakota, where there had been many horses attacked with a malady resembling glanders.

**Morbid Anatomy.**—Histologically, as clinically, the lesions present sometimes the characters of tuberculosis, sometimes those of syphilis. De Beurmann and Gougerot have studied the morbid changes exhaustively, and their papers contain numerous reproductions of microscopical details. The lesions present three types of reaction in combination, namely: (i) a lympho-connective-tissue or syphiloid reaction; (ii) an epithelioid (with giant cells) or tuberculoid reaction; and (iii) a polynuclear or ecthymatiform reaction.

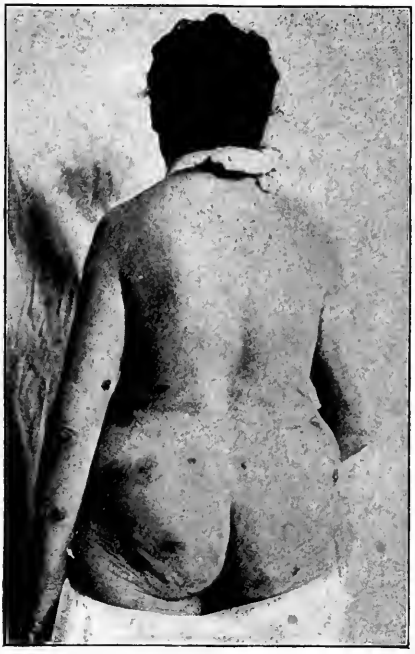

FIG. 115.—Sporotrichosis; disseminated gummas. (From a photograph kindly lent by Dr. Sabouraud.)

**Symptoms.**—Two main clinical types of this affection have been described. First there are the American cases, in each of which the infection took place in the index finger, and was followed by a line of chronic abscesses on the arm connected by a chain of chronic lymphangitis. It was the refractory nature of these lesions which led to their being culturally examined and to the discovery of the sporothrix.

In the second group of cases (the French cases) the lesions consisted of multiple and widely distributed abscesses; these were generally subcutaneous, but were sometimes associated with dermic and epidermic lesions. De Beurmann describes a syphiloid type and a tuberculoid type, according as the lesions simulate syphilitic gummas or tuberculosis verrucosa. It would seem that these modifications represent usually only a different stage of the lesion, but lesions primarily of the lupus verrucosus type have been described. Dor's case with large abscesses seems to be unique. The subcutaneous lesions form cold abscesses or gummas varying in size from that of a pea to that of a small mandarin orange. Their number varies from five to twenty or thirty. They are disseminated without apparent order in the subcutaneous tissue of the limbs and trunk.

The development of the nodules is insidious and painless, and they may therefore be overlooked as long as they are small. They are hard and resistant to the touch, and sometimes lightly adherent to the skin, which becomes at this part red or violaceous, and eventually perforated, the contents of the swelling discharging through the fistulous opening as a greyish-yellow homogeneous pus. The fistulous opening enlarges, its borders become swollen and infiltrated with new small abscesses. Eventually, as the most favourable event, the suppuration ceases, and a violaceous cheloid-like scar remains. Incision of the abscesses does not lead to more

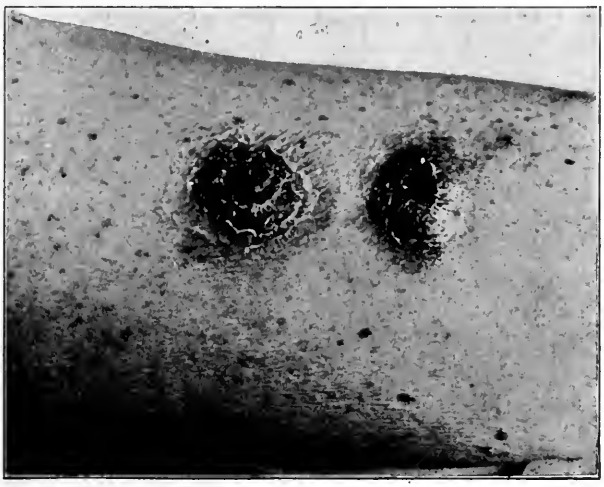

FIG. 116.—Sporotrichial gummas on the forearm. (Sabouraud.)

rapid healing, since the same infiltration and swelling of the borders of wound occur. Sometimes the lesions, instead of undergoing involution in the manner described, shew a further change; the orifice enlarges until it leaves an ulcerated and discharging surface, or a crusted or fungating infiltration, which may resemble exactly the aspect of tuberculosis verrucosa cutis. As a rule, the lymphatic glands remain unaffected. It has not been clearly demonstrated that the viscera are ever infected, though this seemed probable in a case of Massary, Doury, and Monier-Vinard. In one case, which shewed the sporothrix in the sputum, the lungs were sound. In other cases cutaneous sporotrichosis has occurred in association with pulmonary tuberculosis. Most patients, however, have been in good health apart from the lesions of the skin.

Recently, cases have been recorded in which gummas were present beneath the periosteum; with the exception of Bloch's case (*vide* p. 525) these cases have all been tibial periostitis, generally in association with subcutaneous gummas; in one case only have intramuscular abscesses also been present.

*Sporotrichosis of mucous membranes* has been recorded by de Beurmann

and Gougerot, Brodier and Gastou, and Letulle. In Letulle's case the mucous membrane of the whole bucco-pharyngeal cavity was uniformly involved in a vast granulating ulcer, which, however, was not depressed below the surface, and did not lead to any loss of tissue as in tuberculosis or in syphilis. The sporothrix may also exist in a case of sporotrichosis in the bucco-pharynx and in the larynx in a saprophytic state, that is, without causing lesions. Several examples of sporotrichosis of the conjunctiva have been reported, and one case of sporotrichosis of the iris (Jeanselme and Poulard).

**Diagnosis.**—In making a diagnosis the main points to observe are:—multiplicity of lesions, indolence, slow involution, firm consistence, viscid

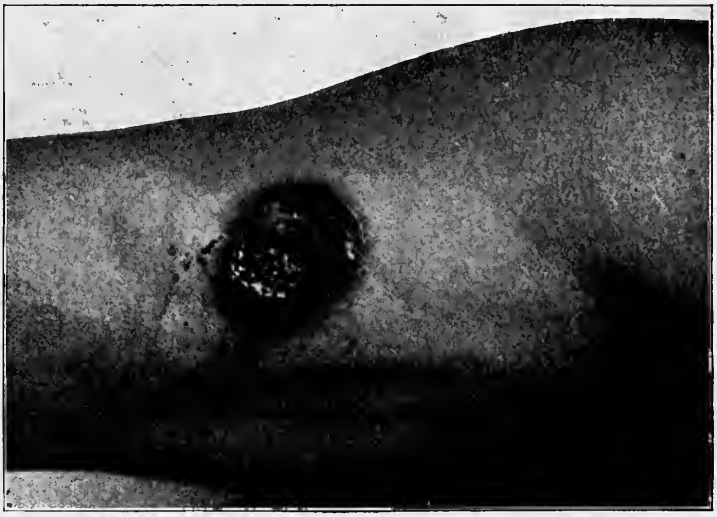

FIG. 117.—Sporotrichial gumma in the region of the biceps. (Sabouraud.)

grey-yellow homogeneous pus, swollen margins with a central fistulous opening into the cavity, usually absence of enlarged glands, and the good general health. The crateriform character of the lesions is especially characteristic. In cases in which the base of the exposed cavity is crusted or vegetating, simulating cutaneous tuberculosis, sporotrichosis is suspected from the central softening of the lesions, and from the occurrence of the more typical gummas elsewhere. Sporotrichosis must be considered, too, in the presence of the gummatous periosteal swellings and chronic intramuscular abscesses. The diagnosis is readily confirmed by cultural methods, remembering the importance of using suitable media and of not capping, and of incubating at the ordinary room-temperature. De Beurmann has shewn that an early orchitis in the rat after inoculation with suspected products is diagnostic of sporotrichial infection. Sporotrichosis is not incompatible with the presence of syphilis or of tuberculosis.

The serum of persons affected with sporotrichosis agglutinates an emulsion of sporothrix (Widal and Abrami). Agglutination also takes place with serum from cases of actinomycosis, but to a much less degree. A positive complement-fixation has also been obtained by Widal in cases of sporotrichosis, using a mixture of spores and mycelium as the antigen.

Much attention has been given recently in France to the intra-dermic reaction to a sporotrichotoxin as a means of diagnosis. Bruno Bloch was the first to obtain a cutaneous reaction with an extract of cultures in bouillon, but further experiment has shewn that this reaction occurs also in patients with other mycotic infections, and even when saprophytic buccal or intestinal mould-fungi are present.

**Treatment.**—It is characteristic of the lesions that they are remarkably obstinate to the ordinary surgical methods of treatment. Under the administration of iodides they rapidly disappear.

H. G. ADAMSON.

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# RHINOSCLEROMA

SYNONYMS.—*Scleroma nasi; Scleroma.*

By A. WHITFIELD, M.D., F.R.C.P.

**Definition.**—A peculiar, chronic inflammatory disease of the upper air-passages and contiguous tissues, resulting in the production of masses of extremely hard infiltration with great deformity of the affected parts.

**Etiology.**—Although a bacillus has been discovered in the affected parts with such unfailing regularity that its presence is universally regarded as characteristic of the disease, its etiological significance is still a matter of some difference of opinion. The disease is almost confined to the poorer classes, and has a very limited geographical distribution. It is found chiefly in the districts lying on both sides of the eastern Danube, in south-western Russia, less commonly in Switzerland and Italy, and again more commonly in South America, especially in Brazil and Salvador. A fair number of cases have been recognised in the United States, but these have been among immigrants; and a very few have been seen in England, also in natives of Russia.

**Morbid Anatomy.**—The disease affects primarily the corium and the deeper parts of the mucous membranes, producing a massive infiltration. The epithelium over the infiltration may be normal, or thinned by pressure, or irregularly hypertrophied with deeply extending ridges. The infiltration consists for the greater part of rows of plasma cells, which are especially numerous around the vessels. Besides these there are two peculiar varieties of cell present. The first is the so-called "Mikulicz" cell. This is an enormous cell, four or five times the size of a leucocyte, with a single nucleus, usually pyknotic and displaced to the side of the cell, the protoplasm of which is filled with a peculiar watery or mucoid substance containing the characteristic micro-organism. The second class of cell is known as the "hyaline" or "colloid" cell, and contains within its protoplasm droplets or masses of a hyaline material which has a strong affinity for fuchsin (both acid and basic), and is probably identical with Russell's "fuchsin bodies."

In the older parts of the infiltration a good deal of sclerotic connective-tissue is formed, and the plasma- and other cells are less numerous. According to Goldzieher and Neuber actual new formation of elastic tissue takes place to a considerable extent in this sclerotic tissue. Cartilage and bone have been described as occurring in the growth, and have been attributed by Chiari to the extension of perichondritic and periosteal overgrowth of the subjacent tissues. Kaposi found in one case, however, a piece of cartilage lying free in the infiltration of the upper lip.

**Bacteriology.**—Since Frisch's discovery of the bacilli in the infil-

tration there has been a good deal of discussion as to their etiological significance, but they are universally admitted to be characteristic of the disease. The bacilli are short rods and coccoid forms, and are found chiefly in the "Mikulicz" cells and occasionally loose in the tissues. They are, according to most modern observers, Gram-negative in their staining reactions and are easily cultivated, shewing well-marked capsules in artificial media. They closely resemble the *Bacillus pneumoniae* of Friedländer, but according to some observers shew slight biological and pathogenetic differences. Perkins, after a careful study, places them in the group of *Bacillus mucosus capsulatus*, along with Friedländer's bacillus and the *Bacillus ozaenae*. He considers that they are secondary invaders, and that the organisms from different cases of the same disease are not identical though all belong to the same group. Kraus believes that the bacilli are the causal agents, and states that he has reproduced the disease in white mice: in his earlier experiments by inoculating them with Frisch's bacillus mixed with staphylococcus, and later by inoculation of the bacillus alone. Goldzieher and Neuber claim to have established the causal relationship of *Bacillus scleromatis* and to have differentiated it from Friedländer's bacillus. This distinction has been confirmed by Brault and Masselot. They shew that it may be distinguished by the method of complement-deviation in the serum from infected patients. They also find that the bacilli differ biologically, that they produce different antibodies in the blood, and have a different pathogenicity.

**Symptoms.**—The disease was originally described by Hebra and Kaposi in 1870 as occurring in the nose and upper lip. Since the original identification of the disease it has been found to originate also in the pharynx, larynx, trachea, lacrymal sac, and ear.

The disease begins insidiously with the development of extremely hard, painless nodules in the corium. At first these are of normal colour and movable on the deeper structures, but as they enlarge they become fixed to the tissues below and shine through the superficial epithelium as purplish swellings with dilated vessels coursing over them. Later they become pale and cicatricial in appearance. The masses of infiltration slowly enlarge, push the alae nasi outwards, and block the anterior nares, so that a peculiar "pug-nose" appearance is produced. The disease also spreads down into the upper lip, stiffening it and causing it to project, and in some cases forming large prominent tumours.

The diseased area is almost always sharply delimited from the healthy tissue around. The consistency of the affected parts is extremely characteristic, and has been likened by Kaposi to that of a plaster cast. As time goes on superficial excoriation and traumatic ulceration may take place, but the affected areas do not ulcerate or necrose spontaneously. Even if the mass is incised, and it is curious how easily the knife enters it, the incision heals quickly. The palate, when affected, shews large hard nodules, at first normal in colour and then pale and cicatricial in appearance. The uvula disappears early and perforation of the palate is not uncommon. The gums, when affected, are thrown into folds, the teeth

loosen and fall out, and the alveolar processes atrophy (Kaposi). The larynx becomes stenosed and aphonia may occur. (For a more detailed account of the affection of the upper air-passages see Vol. IV. Part II., 1908, pp. 54, 140, and Plate V.)

Subjective symptoms are wonderfully slight, considering the profound disturbance of the parts. There is some pain on pressure, but otherwise the symptoms are due to the stiffening of the parts and the blocking of the air-way.

**Diagnosis.**—The disease has to be distinguished, perhaps, from carcinoma and from syphilis. In reality, however, the appearance is very characteristic, and the painless slow growth, the absence of any tendency to ulceration, and the country from which the patient comes are sufficient. If further doubt remains, Wassermann's reaction may be of service, and at all events the histological examination of a small piece will at once settle the question.

**Prognosis.**—This may now be said to depend entirely on the question whether or not the affected part can be reached by the *x*-rays. The disease is not very dangerous to life, but is slowly and invariably progressive if left alone.

**Treatment.**—Formerly no treatment was of any permanent use, since excision was always followed by recurrence; but within the last few years several cases have been published in which treatment by the *x*-rays has been followed by rapid disappearance of the lesions. The masses resolve without ulceration and the tissues apparently return to the normal. Pollitzer's case when exhibited had remained without relapse for three months after the cessation of all treatment, and I have not been able to find the report of any case treated by *x*-rays in which subsequent relapse has been noted.

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# MYCOSIS FUNGOIDES

SYNONYM.—*Granuloma fungoides.*

By T. COLCOTT FOX, M.B., F.R.C.P.

**History.**—The history up to 1891 is well worth reading in the appendix attached by Besnier and Doyon to Kaposi's article on mycosis fungoides in the second French edition of his lectures on the Pathology and Treatment of Skin Diseases. The disease was first noticed by Alibert in 1812 under the name *Pian fungoïde*, and called *Mycosis fungoides* by him in 1835. Bazin in 1851, after a study of several cases, recognised Alibert's observations, considered the disease a special one, and gave a notable clinical description. Clinical studies were continued in Paris by Hardy and others. In 1864 Köbner, after studying the malady in Paris, drew the attention of Germany more especially to the disease, which he regarded as a granuloma. Then followed in 1869 what has been called a histological period, started by Ranvier and followed up by Coillot and others, and in 1893-1894 by Demange. As the result of these microscopical researches the disease was regarded as a cutaneous manifestation of a lymphadenomatous diathesis, and was called *Lymphadénie cutanée.* In 1872 Hebra reported a case, which was further described by Hans Hebra in 1875 and then by Geber in 1878; Hebra published a second case in 1874. Kaposi in 1891 accepted the name *Granuloma fungoides*, and was inclined to agree with Oscar Simon, who considered it a malignant growth of connective tissue engrafted on psoriasis and eczema. In England, E. Wilson called it eczema tuberculatum, and Tilbury Fox collected some cases in the last edition of his *Treatise on Diseases of the Skin* under the name "Fibroma fungoides." In 1877 Duhring was the first in America to describe it under the name "Inflammatory Fungoid Neoplasm." The lymphadenoma view was adopted in Italy, but was gradually abandoned after the discussion in London in 1881 at the International Medical Congress. In spite of its rarity the disease has an immense literature, for, on account of the interest it has excited, a large proportion of the cases observed have been recorded.

**Etiology.**—Though a relatively rare disease, some observers in large hospitals have had special opportunities of studying it; thus in Paris Hallopeau had more than 20 cases under observation in sixteen years. The two sexes are about equally attacked: perhaps males are rather more often affected. The onset is generally after 40 years of age, and the average age is about 45, but several cases have been recorded earlier in life, even at the age of 16 (Brocq). There is no evidence in favour of hereditary transmission or of contagion. The cause is unknown, but various hypotheses have been advanced. At one period in France the prevailing opinion

was that the disease was a cutaneous form of lymphadenoma; this was founded first on the histology, which suggested that of the lymphatic glands, then the marked, almost constant, implication of the palpable lymphatic glands, and further the occasional presence of leucocytosis. This view was subsequently abandoned. In Germany its relations with sarcoma were seriously considered. According to Kaposi it approached nearest to the cutaneous sarcomas, and started from common primary eruptions. Again, some held it to be a distinct morbid entity, approximating to a granuloma or some sarcomas; and lastly it has been thought to be probably due to a special infection causing a granuloma. Hallopeau and Darier are strongly attracted to this view, on the grounds of the mode of development, the genesis of the tumours, and their multiplication. No special organism, however, has so far been definitely isolated as the cause. In 1892 Paltauf critically reviewed and criticised all these hypotheses, and amongst other points objected that the morbid changes were not those characteristic of the infective granulomas.

**Morbid Anatomy.**—Researches seem to prove that the innocent-looking early eruptions are formations special to this disease. The early changes are localised in the sub-papillary layer of the dermis, and are characterised by dilatation of the blood-vessels, especially the veins, accompanied by an infiltration of cells around the vessels, and along the lymph spaces between the connective-tissue elements. The source and nature of the cells have given rise to much difference of opinion. From a study of the literature I conclude that Drs. Galloway and MacLeod have given a sound account of the changes. They describe the presence of (*a*) large oval cells with a granular protoplasm, which stain characteristically; (*b*) some mast cells, mostly round the vessels; (*c*) a few of the plasma cells, of the type prevailing in tuberculous and syphilitic granulomas, which do not form plasmomas; (*d*) numerous small cells of variable size, slightly larger than leucocytes; and (*e*) some tendency to the formation of giant cells. In the early stages the large oval cells divide actively by mitosis, but probably they may also multiply directly by amitotic division. The latter method is greatly predominant in the later stages, especially in the tumours. These observers support the contention that these large cells originate from the fixed cells of the connective tissue, from the fibres of the corium, and also from the outer coat of the blood-vessels, the fibrous sheath of the hair follicles, and of the sebaceous glands, coil ducts, and arrector muscles. In the early stages the white and elastic fibres are unaltered, although separated by masses of cells which do not organise into fibrous tissue. As the infiltration progresses, it extends to the papillae, to a varying depth in the corium, and even into the subcutaneous tissue. The white and elastic fibres become less evident as the cellular infiltration increases, and a fine reticulum only is left, and in tumours this is often difficult to detect. There is an increasing proportion of multiplication by direct division of the cells, and only an ordinary number of mast cells are found. In the later stages the cells break up and discharge their

chromophilic granules. In advanced stages the irregular polymorphism of the cells is a striking and important feature. In secondary infections of the diseased areas, as in ulceration, inflammatory and other changes may be added, including endarteritis and thrombosis. The epithelial changes are purely secondary. The papillae at first enlarge, and the interpapillary processes hypertrophy, and may subdivide; oedema of the rete occurs, and various authors describe the occasional formation of small collections of cells which have been called abscesses. The epidermic formation is necessarily disordered in various ways at different stages, and these parts may atrophy and be destroyed.

As already mentioned, various hypotheses have been put forward to explain the changes described. The French School was at one time confident that the disease was a cutaneous phase of lymphadenoma. Its affinities with sarcoma were considered with some favour in Germany, and Robin regarded it a form of round-celled sarcoma. Some explained the process as a sarcoma arising in common eruptions. Paltauf classed it as lymphosarcoma, and Gaucher as a form of sarcoma and as parasitic. Drs. Galloway and MacLeod say it is a granuloma, as did Köbner long ago. In both the characteristic syphilitic and the mycotic granuloma the change is an active proliferation of connective-tissue cells and imperfect giant cells, and similar epithelial changes occur in both. The cell proliferation in syphilis is less multiform, plasma cells are more numerous, the vessels are more dilated and around them the cell proliferation is at its maximum, and there is an actual increase of fibrous tissue. In syphilis there is nothing resembling the crenation and fragmentation of the cells associated with the later stage of mycosis fungoides. Leredde described in a tumour large connective-tissue cells with big nuclei, and many small cells with faintly staining nuclei, which he regarded as leucocytes. The tumour cells, he says, have a marked tendency to break down, as shewn by crenation, irregularity, and fragmentation. The tuberculous granuloma is more easily distinguished. It is largely composed of plasma cells and daughter plasma cells, and even less multiform than syphilis, and there are giant cells with central caseous degeneration, and a disappearance of the collagen bundles. As to sarcoma, the cells of a round-celled sarcoma are mesoblastic in origin, and regular in size and shape, with absence of synchronous changes in the epithelium in the earlier stages. Spindle-celled sarcoma has very similar characteristics. Dr. Whitfield classes it with malignant tumours. With regard to the cutaneous lesions of leukaemia and lymphadenoma, Drs. Galloway and MacLeod quote Nékám to the effect that in these lesions there is extensive oedema about the cuticular vessels, an active diapedesis from them, and an infiltration of the neighbouring cutis with leucocytes following the lymph spaces, and ascending along the hair follicles and sweat ducts, without proliferation of the fixed cells, mitosis, or imperfect giant-cell formation. Darier still considers that the cells of mycosis fungoides are chiefly lymphocytes.

Many organisms have been found in secondarily infected lesions, but

there is not any definite proof of a parasitic cause of the primary malady. Gaucher's attempts to inoculate the tumour tissue in animals gave negative results.

**Symptoms.**—The cases vary so widely in detail that it is very difficult to describe every minor alteration without overloading the picture and obscuring its great outlines. The typical form is characterised by the progressive evolution in several stages. There is first an insidious onset, with the formation of eruptions of various types, which clinically appear to be what the French call *banale*, and so at one time they were considered to be. These eruptions may simulate erythema, pityriasis, urticaria, lichen papules, weeping eczema, and even pemphigus. They may persist or recur for years, and gradually generalise. At some period, earlier or later, the areas become infiltrated, and then assume a significant feature which attracts attention. Finally, tumours appear, generally from diseased patches, but, it is said, sometimes from healthy skin, though Besnier stated that he had never seen the latter occurrence. The diseased condition of the skin, especially in the tumour stage, tends to be accompanied by an increasing state of cachexia more or less marked, perhaps by septicaemia, and sooner or later the malady terminates fatally. Itching is generally a prominent and distressing feature of significance, and in some cases has preceded all other symptoms. Multiple enlarged lymphatic glands, often voluminous, are also characteristic, but it is said that this enlargement is sometimes slight or even absent. Lastly, cases have been described in which tumours have formed directly (*d'emblée*) without antecedent eruptions, but such cases call for close criticism.

We will now follow this malady through these stages in more detail, but in doing so we may warn the reader that cases come under observation in which evidences of more than one stage are present.

*The Primary or Pre-tumour Stage.*—In addition to pruritus, a primary or herald patch, as in pityriasis rosea, may precede the appearance of the eruptions. Hallopeau, after his attention was drawn to this, observed this occurrence in nearly every case; but Brocq, I believe, does not confirm this. In the reported cases reference is frequently made to the presence of a primary patch, which may be a simple-looking red persistent macule, perhaps slightly scaly or crusted, or infiltrated, or even ulcerated.

The duration of the primary stage varies; generally it lasts from two to five years, but occasionally it is shorter or much longer. It is characterised by the successive evolution of eruptive lesions which tend to multiply, to coalesce, and to generalise. Sometimes almost the whole of the skin may be involved. The elements are at first superficial, and may suggest such common affections as some form of localised erythrodermia, pityriasis, psoriasis, dry or vesicular eczema. Papules may also form, and, mixed with erythematous areas, may suggest acute lichen planus or pityriasis rubra pilaris. Hallopeau describes small, red, round, slightly raised lichenoid papules, and indolent follicular papules centred by a hair, and little whitish-yellow miliary nodules. The most frequent

type is a disseminated eruption of round or oval indolent, reddened macules, with well- or ill-defined borders, slightly or markedly desquamative. They may vary in size from that of the finger nail to that of the palm of the hand or more. These lesions may clear in the centre and form rings, simulate urticaria, or vesicate and suggest pemphigus bullae. Not infrequently, in contrast with the dry patches, vesicular or weeping areas form and are indistinguishable clinically from eczema. Vesicles have been described on the hands and feet. Audry noted a pustular eruption. These eruptions may be more or less persistent, but, like the lesions of all stages of this disease, may disappear spontaneously, some leaving pigmentation. Pruritus is generally a prominent symptom; it may be intense, or in exceptional instances slight. To the general

FIG. 118.—Mycosis fungoides; right arm shewing red patches of skin, and also a solid tumour (J. F. Payne's case).

picture of the eruption are often added the results of scratching and tearing, such as excoriations, blood crusts, and lichenification, but never, Hallopeau says, true prurigo papules. The scratching may cause spreading secondary coccic infections. The nails may be dystrophic, and in some cases shed. The greater part of the body may be involved, and in some cases raw patches have been noted on the buccal mucous membrane.

*The phase of infiltration* is considered separately in order to emphasise this characteristic feature. Sooner or later the eruptive lesions thicken with infiltration, and project from the skin. Sometimes small nodules can be better felt than seen in the skin. The folds of the body hypertrophy, and look too large for the underlying parts. The face is frequently affected, and presents a leprous aspect, eversion of the lips, ectropion, and a double chin. There may be oedema in certain regions. The surface of the plaques may be quadrillated and lichenified. A frequent symptom is the implication of the scalp and other hairy regions, with

almost complete fall of the hair. Sweats sometimes occur. In these earlier stages the characteristic enlargement of the lymphatic glands may be evident. This is nearly constant, but according to Bazin it may be temporary, and does not occur in all cases.

*The fungoid* or *tumour stage* originally attracted attention and suggested the name Mycosis. The tumours, so characteristic of the later stages, do not have any special distribution. They almost always arise in areas already diseased, but, it is said, they can occur on apparently healthy skin. They may be from a pea to an apple or

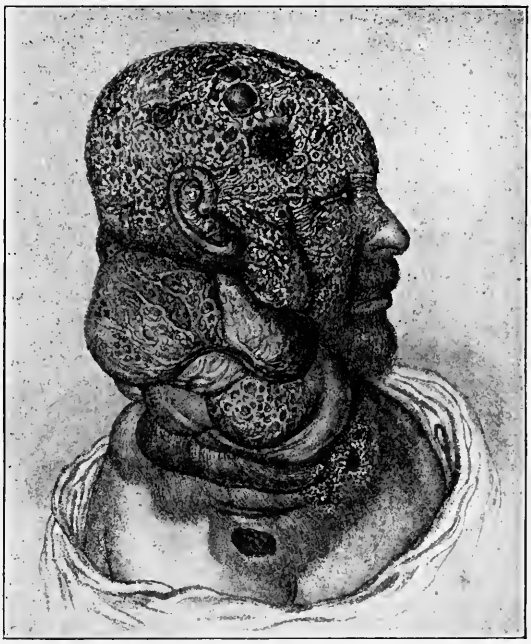

Fig. 119.—Mycosis fungoides (J. F. Payne's case).

more in size, and are mostly oval or rounded, and may be somewhat lobulated, cupped, or rather pediculated like a mushroom. They are circumscribed, but may have a zone of infiltration over which they spread. By confluence they may form hideous groups, for instance about the head and face (Fig. 119). The surface tends to become slightly vegetating. Interstitial haemorrhage may occur, and the colour may then suggest a melanotic sarcoma. Lastly, they may excoriate and exude, or ulcerate, or become gangrenous. It is a characteristic that they may disappear spontaneously. Visceral lesions have been detected during life, such as enlargement of the liver and spleen, and necropsies have often revealed morbid changes in these organs, and in the kidneys and adrenals, and areas of ulceration and of congestion in the intestines. Some of the lesions found

may be due to intercurrent diseases, such as apoplexy, or the results of septicaemia or intoxication, but some changes have been described as definitely of the same nature as in the skin.

*The blood* often shews a variable leucocytosis, as in many forms of cachexia and malignant disease. There may be a slight eosinophilia. *The urine*, according to Gaucher, is normal; cryoscopy shewed a low freezing point; researches for alkaloids by Chibert's method were negative; and the urine was not toxic.

*The general symptoms* are, in many cases, unimportant for a long time, though during periods of activity there may be some fever. In some cases there is a rapid decline in health, but it is in the tumour stage especially that the patient becomes cachectic and wastes, suffers from anorexia and disorders of digestion, and perhaps from diarrhoea, as in pemphigus. In a progressive malady such as this the health may be undermined by various agencies, apart from the primary disease, such as the insomnia and depression produced by intense itching, and secondary intoxication or infection from the invasion of the skin by micro-organisms, especially when there is ulceration. The implication of the viscera will contribute to the agencies at work, and fever may be present.

*The course* of the malady is progressive; it may be comparatively rapid, and some patients have succumbed before the tumour stage. But it may be protracted with a varying number of intermissions over many years. Sooner or later the patient dies from some intercurrent disease such as pulmonary engorgement or pleuro-pneumonia, or simply fades away.

**Prognosis.**—This is very gloomy, though some cases last many years. Amelioration and temporary cessation of the process have encouraged hope, and drugs have earned credit for producing good effects; but renewed outbursts are the rule. Bazin, however, recorded the cessation of the disease for twelve years after an intercurrent attack of erysipelas.

**Diagnosis.**—From what has been said it will be obvious that it is extremely difficult to diagnose the earlier eruptions with certainty; but the following three characters are suggestive, namely, the itching, the resistance to treatment, and the readiness with which the lesions become inflamed under resolvent applications. The generalisation should also excite suspicion, and the infiltration of the lesions in many forms will at once attract attention. Lastly, help can be obtained by histological examination of a piece of tissue. The malady has been at first diagnosed as acute lichen planus, eczema, erythrodermia in patches, and so on. The generalised erythrodermia with adenopathy may cause difficulty in connexion with lymphadenoma, especially as the latter may be associated with prurigo-like papules and cutaneous growths. When the tumours form after preliminary eruptions the diagnosis becomes certain. Tumours *d'emblée* must be difficult to distinguish clinically from sarcomas.

**Treatment.**—As the cause is unknown the treatment must be empirical, and all sorts of remedies from arsenic to Coley's fluid have been tried; external resolvent remedies must be used with caution. The

one aid we have, at any rate in mitigating and prolonging the course of the disease, is the application of *x*-rays, which for a time may clear up existing lesions, keep their growth in check, and so prolong life. Many cases thus treated have been described as looking cured, but it would be interesting to learn the after-result.

LYMPHODERMIA PERNICIOSA.—In 1885 Kaposi described an affection which he regarded as a true leukaemia of the skin. It commenced with an oozing eczema which was very pruritic in the desquamative stage. The patches increased and the eruption became generalised. Then a thickening of the skin supervened, and dermic and subcutaneous nodosities, partly ulcerated, appeared. There was adenopathy, a much enlarged spleen, profound ill-health, and an absolute increase of white blood-corpuscles. At the necropsy the spleen was very large, and the spongy tissue of the sternum, the vertebrae, the tarsal and long bones was greyish from the presence of leucocytes. There were leukaemic nodosities in the pleurae, lungs, and dermis, the latter being mainly in and arising in the adipose layer. The lymphatic glands also presented leukaemic changes. Kaposi thought his case approached to that of Biesiadecki, in which there was a true leukaemia with small cutaneous leukaemic tumours. If this be so, the malady cannot be mycosis fungoides, though French writers are inclined to classify it as such.

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## CALCAREOUS DEPOSITS IN THE SKIN

By H. G. ADAMSON, M.D., F.R.C.P.

CIRCUMSCRIBED deposits of calcareous material in the skin or in the subcutaneous tissues may depend on various causes. Chronic abscesses, dermoid cysts, lipomas, fibromas, sarcomas, epithelial and other localised cellular growths may undergo calcareous change, phleboliths may form in subcutaneous veins, and a form of subcutaneous concretion in the form of hemp-seed-sized grains on the inner side of the tibiae occurs in old people as the result of calcification of lobules of adipose tissue—the stony tumours of Poirier. In addition there are two forms of calcareous deposit in the skin, which have been called respectively "Calcified Epithelial Tumours (épithéliome) of the Sebaceous Glands" and "Subcutaneous Calcareous Granuloma." These are of sufficient interest and importance to need separate descriptions.

**Calcified Epithelial Tumours (*épithéliome*) of the Sebaceous Glands.**—Under this heading Malherbe of Nantes described, at the International Medical Congress in 1881, 12 cases of cutaneous calcification occurring

chiefly in women and in children. They consisted of circumscribed indolent tumours containing a chalky substance. Similar cases have been recorded in this country by Sir F. Eve, F. T. Paul, and J. Hutchinson, jun., and many examples by continental writers. That these tumours are really of the nature of sebaceous gland adenomas is not at all certain. Unna considers that many of them may be inflammatory in origin, since a cellular infiltration with giant cells around the calcareous deposit was an almost constant feature. A case described by Thimm of a disc-like chalky tumour of eight years' duration on the little finger of a man aged twenty-three, was regarded by him us the result of a sebaceous gland change with the formation of retention cysts, the contents of which had undergone calcification. In this case also there was a chronic inflammatory process with giant cells. Wildbolz has recorded the case of a woman aged fifty-seven with growths on the fingers, toes, and elbows, of six to seven years' duration, in which the calcareous deposit infiltrated all the structures, but which he thought began as a calcareous degeneration of the elastic fibres. Löwenbach saw 2 cases, one in a young man in whom there were hemispherical nodules in the skin of the scrotum. The chalky deposit lay for the most part in unaltered connective tissue, but one nodule was surrounded by a cellular infiltration with giant cells. Löwenbach's second case probably belonged to the next group, for the lesions, which appeared a few months before death in a tuberculous woman, were multiple. It is difficult indeed to know whether these cases with single lesions are not sometimes early stages of the second class, for, as will be seen below, the chief difference between the two groups is that in one the lesion is single, of long standing, and occurs usually in an adult; in the other the lesions are multiple, and generally occur in young people.

**Subcutaneous Calcareous Granuloma.**—The second group has been particularly studied in France during the last decade, and especially by Milian and by Profichet, whilst Lewandowsky and Jadassohn, in Germany, have also observed and written about these cases. A dozen or more examples have now been described. The affection generally occurs in young subjects, and most often in country people. There is generally a history of an injury, followed by a painless swelling, usually on the situation of a subcutaneous bursa. The swelling is soft and fluctuating, and does not at first involve the skin. It gradually enlarges, and the skin may become yellowish in colour; the base remains hard, but the skin is thinned, and if opened there escapes a thick creamy viscid liquid with yellowish chalky grains in suspension. Very rarely the lesion remains local, and generally fresh ones appear after months or years. Sometimes, especially in old people, the fluid of the tumour dries up, so that the growth becomes of stony hardness. Other tumours may open by many perforations, but spontaneous absorption with cicatrisation is rare. In cases of long standing there may develop general muscular atrophy and fixation of the joints, sometimes with skin changes—thickening, ichthyosis, pigmentary patches. In such cases there may be rapid

wasting, with bedsores, albumin or blood in the urine, fever, diarrhoea, and death from exhaustion. Four fatal cases have been reported.

**Morbid Histology.**—These lesions consist of nodular collections of embryonic cells with giant cells, and closely resemble the microscopical changes in tuberculosis, but with the central parts occupied by calcareous granules. In old lesions there may be only a fibrous-walled cavity filled with chalky matter. The chalky deposit consists of carbonate and phosphate of calcium, and does not contain any uric acid.

**Etiology.**—Milian is of opinion that the histological appearances point to a microbic infection, although he has discarded his former view that the affection is coccidioidal. He argues that the hypothesis of parasitic origin is supported by Duret's two cases in a brother and sister, and by the fact that contact with the soil is a common feature. In a recently published case Kraus obtained a tuberculin reaction, and Löwenbach's case in a tuberculous patient has already been mentioned. In no other instance, however, has there been any evidence of tuberculosis; and in the necropsies made on the cases reported by Profichet, by Jeanne, and by Jadassohn no sign of tuberculosis was found. In Jadassohn's case the boy died of suppurative osteomyelitis of the pelvis and ribs, with multiple abscesses in the internal organs, and it is curious to note that the chalky masses in the skin gave rise to little or no inflammation, and that giant cells were not present. Jadassohn found that the process began as a calcareous infiltration of the elastic fibres followed by their fragmentation, and by swelling, degeneration, and calcification of the collagen bundles. A relationship between this affection and sclerodermia has been suggested by Thibierge and Weissenbach, who reported a case of associated subcutaneous concretions and sclerodermia. Lewandowsky's suggestion that the affection is a metabolic anomaly, like gout or diabetes, would explain many of the features of the disease, for it is reasonable to suppose that the granulomatous formation may be a direct result of the local presence of the chalky deposit and not necessarily due to microbic infection. It is possible, indeed, that in the first group of cases with single lesions, the frequent presence of granulomatous infiltration around the chalky deposit is also a result of local irritation from its presence, the calcareous change being not necessarily of the same origin in all cases.

The *treatment* in these cases has usually been surgical removal.

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## AFFECTIONS OF THE PIGMENTARY SYSTEM

By J. J. PRINGLE, M.B., F.R.C.P., and J. E. R. MCDONAGH, F.R.C.S.

**On the Nature and Origin of Normal and Abnormal Skin Pigment.**—Of recent years our knowledge of the pigmentation of the skin, both normal and abnormal, has become comparatively accurate and well defined. All skin pigment, whether in health or disease, has its point of maximum intensity in the deepest layers of the epidermis, but there is usually a certain amount in the adjacent upper layers of the corium. Kölliker's investigations in 1860 were the first really scientific attempts to elucidate this difficult and important question. He regarded all pigment-cells as originating indirectly from haemoglobin through the intermediary of so-called "chromatophores," which he described as transuded blood-corpuscles migrating into the upper layers of the corium and lower layers of the epidermis, and there parting with their haemoglobin, which ultimately underwent various chemical changes resulting in the formation of melanin, an iron-free pigment. The view that pigment may be derived from the blood is still in a limited sense accurate, as the skin may certainly be stained by blood diffused into its texture (erythema, purpura, varicose dermatitis), leaving behind it pigmentary deposits containing iron (haematin) and undergoing identical metamorphoses. But many observers since Kölliker's time have completely disproved the existence of cells

possessing such peculiar qualities as his hypothetical "chromatophores," which have no analogies in nature.

The "autochthonous" origin of skin pigment, namely, its production *in loco* in various circumstances to be afterwards considered, was first formulated by Jarisch in 1892, and has since been fully confirmed by the observations of Mertsching, Meirowsky, and many others.

Karg's well-known experiments appear at first sight to afford cogent evidence in favour of Kölliker's chromatogenous views. He transplanted, by Thiersch grafts, the skin of a white man on to a negro, with the result that the grafts became pigmented; the reverse process of depigmentation occurred when a portion of a negro's skin was transplanted on to a white man. These grafts, however, were purely epidermic, and without any blood-supply; and Meirowsky has shewn by the most convincing experiments that epidermis can become deeply pigmented after exposure to Finsen rays, or even as the result of the application of heat to areas of skin completely deprived of blood by pressure; moreover, Karg's experiments can be fully and more satisfactorily explained by the chemico-fermentative view of pigment formation, which supplies many gaps in our knowledge left by the purely haematogenous hypothesis. Schwalbe's experiments on the changes of pigmentation in the hair and skin of animals, whose coats undergo seasonal variations in colour, afford strong arguments in favour of Jarisch's view. When the hair is white, as in winter, both epidermis and hair are devoid of pigment; when, however, the summer coat is assumed pigment is found in the matrix cells of the new hairs and especially around their nuclei, only after which does the epidermis shew any sign of pigmentation. All the year through in such animals, the corium is completely devoid of pigment. Meirowsky has also proved that epidermic grafts separated from the body, but kept alive, may become pigmented or even hyper-pigmented by exposure to Finsen-rays or heat.

The investigations of R. Hertwig, Rössle, and others have carried the matter a point further by shewing that the pigment is formed by the migration of the nucleoli from the nuclei of the cells, this being clearly demonstrated by Staffel in melano-sarcoma, and in the mast cells so characteristic of xerodermia and urticaria pigmentosa. The nature of the means by which certain cells are excited to the formation of pigment is still uncertain; but Meirowsky's experiments shew that the ultra-violet rays exert an influence upon selective parts of the nuclei of the specialised cells, which determines in them an affinity for certain dyes (for example, pyronin) which gradually become transformed into a pigment indistinguishable from that of normal skin. Further evidence is gradually accumulating in favour of the view that pigment formation is the result of a chemico-fermentative action. The original experiments in this direction were made by Bourquelot, who, after proving that the deep coloration undergone by fungi, when dying, depends upon the presence of an oxidising ferment, subsequently succeeded in producing the same colour, by mixing tyrosine with an emulsion of fungi. Neuberg has also

obtained from melanotic sarcoma a ferment which produces melanin when brought in contact with adrenalin, which is known to be a by-product of tyrosine. The condition described in 1866 by Virchow as ochronosis may, without labouring the argument, be adduced in favour of these modern views. The characteristic phenomenon of the disease is a deep yellow-brown or black pigmentation of the cartilaginous, elastic, and connective tissues of the body; the ears and hands, however, are of a bluish tint owing to the depth at which the pigmentation is found in the corium. Albrecht, resuming the study of this curious condition in 1902, established its occurrence in persons with alkaptonuria; and it has been shewn that it may be produced by the absorption of carbolic acid from long-applied dressings to wounds or sores (Pick, Pope, Beddard).

The bearing of all these briefly epitomised facts upon the etiology of many of the conditions to be described under the heading of chloasma, will at once be self-evident.

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Freckles.—Syn.: *Lentigo; Ephelis* (a Hippocratic name; probably derived from ἥλιος, the sun).

**Definition.** — Multiple, circumscribed, small pigmentary macules, usually situated upon portions of the skin exposed to sunlight.

**Etiology.**—From the etiological standpoint freckles may be considered as an *actinic melanosis*—a pigmentary disorder due to the influence of the chemically active rays of the sun. The heat rays, as for other allied conditions (for example, sunburn), probably play a merely subordinate part in their production, nor is "inflammation" a powerful factor in their causation. There seems little or no reason to invoke the participation of moisture, fogs, and the like, as was done by the older writers. Both *sexes* are equally liable to the affection, and it is impossible to avoid the

conclusion that there must be a personal as well as a family susceptibility to irritation by the actinic rays of sunlight. Freckles, as a rule, appear in the seventh or eighth year of life, but seldom become marked till the second decade. Children with fair skins, delicate complexions, and especially with red hair, are specially prone to them; but they are occasionally seen in mulattoes, and even in negroes. The occurrence of freckle-like pigmented spots in some cases of rheumatoid arthritis is described elsewhere (Vol. III. p. 14).

**Morbid Anatomy.**—Cohn's researches shew that a freckle is merely an increase of true melanin in a circumscribed portion of the basal layer of cells of the rete Malpighii, with a few pigment granules in the papillary layer. The cutis and the vessels are normal.

**Symptoms.**—Freckles occur chiefly upon the face; especially on the root of the nose, the forehead and cheeks, and on the neck, backs of the hands and forearms; not infrequently they appear also on parts of the body not exposed to direct sunlight ("cold freckles"). To such cases some authors, especially of the French School (Rayer, Bazin, Hardy, Thibierge), unnecessarily suggest the restriction of the name *lentigo*, unless, indeed, Unna's view be correct that "cold freckles" are really small pigmentary naevi: the back, buttocks, and genital regions are, perhaps, the parts most frequently thus affected. Freckles have been described as extending from the circum-oral skin to the lips and buccal mucous membrane, but there seems some probability that these cases are in reality examples of aberrant xerodermia pigmentosa. In colour, freckles usually vary from a pale buff to a deepish brown, but sometimes are of greenish tint. They may often be discerned as originating round the orifices of ducts (Jamieson). They range in size from a pin's head to a lentil, and in outline may be either roundish or irregular; they may be sparse or very abundant, sometimes even confluent, so as to form pigmented patches of considerable size.

Freckles usually appear for the first time with extraordinary rapidity in summer, and totally—or more frequently partially—disappear in winter, to reappear in succeeding summers. Cases have been described as unilateral in distribution (Robinson). As a rule, persons liable to freckling do not bronze or become generally deeply pigmented after exposure to strong sun or sea-winds. No subjective symptoms are caused by freckles, but the amount of resulting disfigurement frequently prompts those who suffer from them to apply for relief. After middle life the condition is prone to diminish, and on the attainment of old age to disappear entirely. Crocker, however, stated that lentigo forms part of the skin-atrophy of old age, and that it occurs on covered parts after eczema in senile persons. Atrophy of skin, whether a primary condition of old age or secondary and dependent on some previous inflammatory trouble, is very liable to become pigmented. The increase of pigmentation is almost certainly a means of protection, since there is a close relation between pigmentation and malignancy; when pigmentation fails, malignancy not infrequently commences. The primary changes in the

cell in both cases are identical; but why in one case a cell should become pigmented and in another malignant, is not certain, and how great a part fermentation plays cannot at present be estimated.

**Differential Diagnosis.**—Freckle-like lesions appearing in the first or second year of life are almost always the precursors of the grave disorder termed xerodermia pigmentosa (*vide* p. 611). The accompanying inflammatory changes and subsequent roughness (xerodermia) with atrophy and wart-like malignant growths, as a rule, enable a differential diagnosis to be easily established. Some reported cases, however, appear to form a clinical connecting link between simple freckles and the graver disease (Jamieson, Hutchinson). We are inclined to classify Crocker's lentigines of old persons with the senile form of xerodermia pigmentosa, described more particularly by Falcao. The seat and discrete distribution of ephelides distinguish them from the diffuse pigmentary disorders described under the title of chloasma.

**Prognosis.**—Freckles generally spontaneously diminish or disappear in winter and after middle life.

**Treatment.**—This is practically identical with the treatment of chloasma (*vide* p. 558). In some cases good results may be obtained—at least temporarily—by touching each freckle with pure carbolic acid; in others electrolysis, employed in the same manner as for the destruction of superfluous hairs, has been recommended.

Wearing a red or brown veil is a useful prophylactic measure; and ointments containing peroxide of hydrogen, oxychloride of bismuth, and corrosive sublimate with lanoline and vaseline, have been advocated (Unna), and are worthy of trial. Whatever treatment may be adopted, the condition invariably recurs, and it seems seldom justifiable to advocate measures which necessarily involve considerable discomfort or even risk.

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Chloasma (χλοάζειν; to be pale green). Syn.: *Melasma; Melanodermia; Liver-spot.*

**Definition.** — Single or multiple, yellow or brownish pigmentary patches on the skin, larger than those described as ephelides, and not attributable to the effects of sunlight. This definition is intended also to include diffuse forms of pigmentation dependent upon constitutional causes, which are sometimes described under the name of melasma.

**Etiology and Pathology.**—Numerous and widely divergent pathological conditions underlie the various forms of hyper-pigmentation of the skin comprehended under the term chloasma. The following statements, modified from an old classification by Kromayer, may, however,

be made without transcending the limits of our positive knowledge. Excessive pigmentation of the skin may result from—(i) haemorrhage into the skin or subcutaneous tissues, as, for example, in erythemas, various "purpuras," and ecchymoses. Here the derivation of the pigment from the colouring matter of the blood is obvious. (ii) As the result of inflammatory changes with transudation, produced by chemical or other irritants (blisters, sunburn, Röntgen rays, pruriginous affections). (iii) As the result of other inflammatory affections of the skin, which may be called "idiopathic," to indicate that we are totally in the dark as to their etiology (lichen planus, pemphigus, psoriasis, "eczema," especially in dependent positions). (iv) As a pure hyper-pigmentation, unaccompanied by inflammatory changes, but evidencing diseases of other organs (syphilis, Addison's disease, Graves' disease, pancreatic disease, leprosy, malaria, etc.). By many writers this form of hyper-pigmentation is considered as "reflex," but no argument worthy of the name can be adduced in favour of this view, unless it be its occurrence in connexion with pregnancy and sexual disorders of women. By other writers this form of pigmentation is regarded as "toxic." (v) As the first stage in various malignant skin diseases; for example, xerodermia pigmentosa, acanthosis nigricans, pigmentary sarcoma and carcinoma. The occurrence of senile xerodermia pigmentosa (Falcao) from freckles of life-long duration, and of malignant disease from congenital pigmentary moles, is significant of a closer connexion between the various members of the group than is at first apparent. The intimate etiology of these latter groups which are now proved to be of chemically toxic origin (autochthonous), apart from blood-derivation (haematogenous), is briefly discussed on p. 547. (vi) As the result of mere mechanical deposit of substances foreign to the body in insoluble chemical combination without structural alteration of tissue (albuminate of silver in argyria).

**Symptoms.**—Patches of idiopathic chloasma are usually situated on the face and neck, where they are frequently symmetrical with well-defined margins; but they may be present on any part of the body, and the colour may merge gradually into that of the surrounding skin. The condition is comparatively rare, and nothing is known of its etiology except that it is often congenital and hereditary. The pathological condition consists merely of a great increase in amount of the normal skin pigment in the rete Malpighii and superficial layers of the corium over the affected area. Patches of stained skin may be due to various local irritants, and it appears convenient to consider such a condition here. The so-called *Chloasma traumaticum* includes such discolorations as those produced by pressure and friction (for example, of trusses or bandages), or by local irritants, such as blisters, sinapisms, and tincture of iodine. And—absurd as it may seem—pigmentary patches produced by such means by malingerers or hysterical persons are not infrequently mistaken for real pathological conditions. It is of practical importance to remember that in a certain small proportion of cases the pigmentary patches thus produced may be permanent; whilst in others, as in a case

recorded by Dubreuilh, the pigmentation may extend widely beyond its original distribution.

The vagabond's disease, or *Morbus erronum* of Greenhow, is simply an extensive pigmentation of the skin due to the combined effects of pediculosis, scratching, and exposure. In a few rare cases (Thibierge) the mucous membranes are said to have been affected. The disease probably corresponds to the pityriasis nigra of Willan. The graver disorder described as acanthosis nigricans (*vide* p. 629) begins as patches of deep pigmentation, soon followed by the development of follicular warty growths, especially in old people, and are often the precursors, or constitute the first stage, of various forms of malignant disease of the skin.

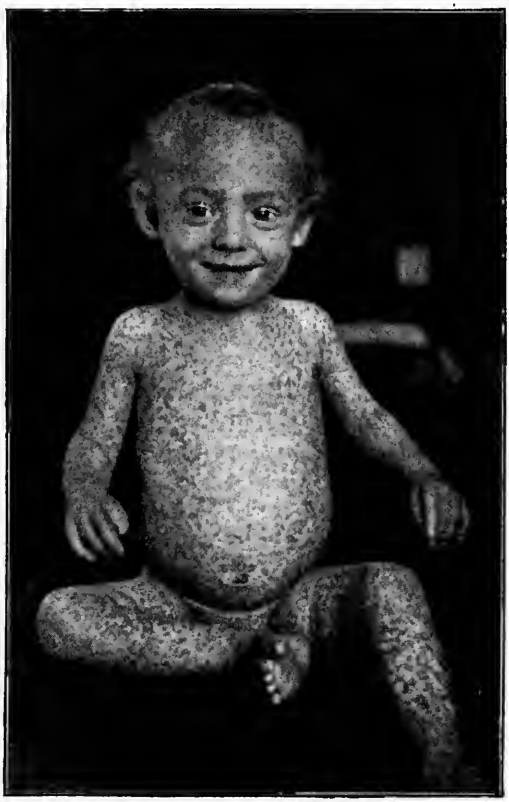

FIG. 120.—Urticaria pigmentosa. The pigmentation affects more or less the whole body of a child who is generally in perfect health. (Photograph by Dr. H. G. Adamson.)

*Chloasma caloricum* is generally due to prolonged exposure to extreme heat. The face and neck, chest, hands, and forearms are consequently the parts most frequently affected. Crocker and Carrington reported similar cases from exposure to great cold.

*Chloasma uterinum* is generally observed in women who have been frequently pregnant, but is not infrequently seen in sterile women in association with various uterine, ovarian, or other pelvic diseases or disorders. The pigmentation is most conspicuous on the face, especially on the forehead and in the temporal regions, whence it spreads over the cheeks, and not infrequently appears with extraordinary rapidity, cases being reported in which it has appeared within even a few hours of the occurrence of cyesis. It is also present over the nipples and central line of the abdomen. The women severely affected are frequently of dark complexion, and the amount of disfigurement produced is often very distressing. In exceptional cases the colour may be quite "bronze"

whilst in others the appearance is that of severe freckling. After parturition the pigmentation usually diminishes, but only to recur with increasing severity at each succeeding pregnancy. The chloasma of sterile women often undergoes well-marked monthly or seasonal exacerbations. Both forms of uterine chloasma usually disappear or diminish after the menopause. Kaposi, quoted by Crocker, reports the curious

FIG. 121.—Leucodermia syphilitica, characterised by circular white areas. (Photograph by Dr. H. G. Adamson.)

case of a lady with a large pigmented mole on the neck, which became quite black at each pregnancy, and was always the first manifestation of her condition.

The name *Symptomatic chloasma* connotes various conditions in which the pigmentary changes are the result of antecedent skin eruptions, or indicative of concomitant cachexial conditions. The pigmentation following multiform erythema, its congener purpura, or any other form of haemorrhage into the skin, is seldom of long duration. That which results from lichen planus (which is sometimes almost black), various syphilides, and urticaria pigmentosa is, on the contrary, generally of

extreme persistence, and is often of great value as a diagnostic point; but it must be borne in mind that psoriasis, especially when treated by arsenic, or any old-standing eruption below the knee, especially in persons with varicose veins, may become deeply pigmented. Our own experience is that the importance of pigmented scars as diagnostic of old syphilis is greatly overestimated. The coexistence with multiple soft cutaneous tumours is pathognomonic of von Recklinghausen's disease (*vide* Vol. VII. p. 369).

With leprosy, sclerodermia, Raynaud's disease, peripheral neuritis, and senile atrophy of the skin, patches of chloasma generally coexist.

The pigmentary "dappled" syphilide, or *Leucodermia syphilitica*, is a common specific manifestation, and one of considerable value in diagnosis, on account of its persistence when all other signs have disappeared; its recognition and importance are still greatly underestimated in this country. It affects the neck, upper parts of the back, and anterior axillary folds, but very rarely involves the whole body. It is more common in women than in men, in the proportion of 10 to 1. It usually appears six months after infection, and may persist for three or four years, mercury having absolutely no influence on its course. The lesion is typical and diagnostic of syphilis. When seen early there are several circular depigmented areas about the size of a sixpence surrounded by a pinkish halo. These are developed from macules, and the gradual transition between the macules and the pale spots is often clearly perceptible. Later the halo disappears, the white areas often assuming the form of a rosette with a hyper-pigmented spot in the centre. This hyper-pigmented spot indicates where a papule has developed upon a recent macule.

Deep pigmentation of the skin, assuming various tints, from a mere sallow earthy discoloration to a deep brown hue, is present in Addison's disease in regions of the body normally most pigmented (armpits, navel, areolae, buttocks, genital regions, linea alba, and flexures of larger joints); it often invades the mucous membrane of the mouth, vulva, glans penis, and anus, and it is frequently present on the face, backs of the hands, or other parts habitually exposed. Cicatrices, whether recent or old, often become pigmented. Occasionally the melanodermia is universal, and increased pigmentation of the hair and a yellow tint of the nails have been noted.

In Graves' disease pigmentation may be general, patchy, or freckle-like; and it is seen in rheumatoid arthritis (*vide* Vol. III. p. 14), and in abdominal tuberculosis, as well as in various diseases of the liver, stomach, spleen, and pancreas.

A general bronzing of the skin occurs in association with diabetes mellitus and hypertrophic cirrhosis of the liver, and is known as diabète bronzé (Hanot and Chauffard). Prof. Osler pointed out that this condition was a haemochromatosis—that there was some agent which broke up the haemoglobin, producing a chronic interstitial inflammation of the liver and pancreas, changes in the latter being responsible for the

diabetes, which, having once set in, usually ends fatally, unless relieved by operation (Mayo Robson). This blue or slate-coloured pigmentation may be indistinguishable from argyria. The oft-cited case of "Blue Mary," recorded by Maude Abbott, was so called from the slaty colour of the exposed parts of the body, and a case reported by Dr. Mitchell

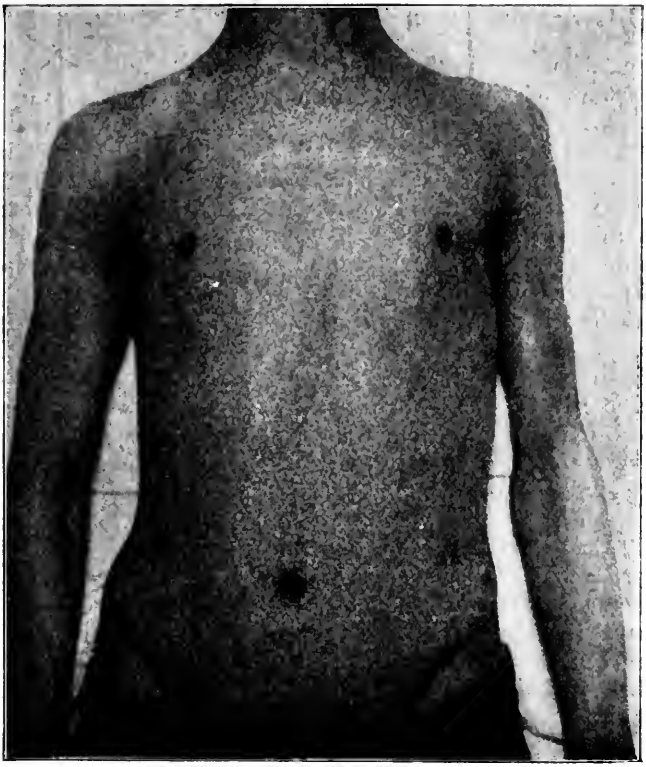

FIG. 122.—Arsenical pigmentation, characterised by a widespread pigmentation with "rain-drop" non-pigmented areas. (Photograph by Dr. H. G. Adamson.)

Bruce was almost certainly of the same nature. In 1906 Futcher collected 35 cases.

Cutaneous pigmentation, apart from the administration of arsenic, has been seen in the splenic anaemia of adults and in pernicious anaemia (Hale White, Aitken, Moorhead, French).

Radcliffe Crocker recorded a case, apparently the result of severe constipation, independent of uterine disorder; and the dependence of "seborrhoea nigricans" upon this condition is fairly well established. Probably the acme of general or extensive hyper-pigmentation of the skin is reached in persons suffering from old-standing malaria, and in kala azar (Vol. II. Part II. p. 234).

Special reference must also be made to *arsenical melanosis*, which appears as small, diffuse pigmented spots, or more rarely as large pigmented areas, especially on those parts of the skin which are normally most deeply pigmented, viz. the neck, upper part of chest, abdomen, nates, bends of the knees, and genitals. The mucous membranes are not pigmented—a most valuable differential diagnostic sign from Addison's disease. As a rule the melanosis first makes its appearance when arsenic has been used for several months in increasing doses. Müller and Schlesinger have described cases from the administration of arsenic in small quantities for only a few weeks, and Mathieu reports an interesting case of a patient who had taken arsenic daily in moderate doses for nine years, melanosis making its appearance only when the dose was increased after that period. The tendency is for the pigmentation to disappear very slowly if the arsenic is stopped; but in some cases the melanosis persists throughout life, and the same remarks apply to the hyperkeratosis of the palms and soles, which is an invariable concomitant of arsenical pigmentation (*vide* p. 105).

Arsenic is also the cause of secondary pigmentations in psoriasis and in lichen planus. The connexion between arsenical pigmentation and these skin diseases has long been known to French authors (Devergie, Bazin), who called the lesions produced *taches arsénicales*.

A condition presenting clinical analogies is the pigmentation due to the ingestion of salts of silver, administered medicinally or otherwise (argyria); but as the administration of silver nitrate, especially in cases of epilepsy, has been practically abandoned, it now occurs much less frequently than formerly But internal administration is not the only way of producing argyria, as men who work with silver are liable to it, and numerous cases have resulted from frequent cauterisation of the mouth and throat with lunar caustic, the patches of pigmentation corresponding accurately with the areas cauterised.

"Trade argyria" is usually local and dependent upon the introduction of small particles of silver into the skin, and is therefore limited to the exposed parts (arms, face, and neck). The lesions are bluish-black, may be as big as a hemp seed, and remain unchanged throughout life. Graefe and others have reported argyrosis of the conjunctiva, as a result of using silver nitrate compresses and drops. Universal argyria may result either from the internal administration of silver or from local applications. The pigmentation is not confined to the skin, but affects also the mucous membranes, stomach, intestines, liver, spleen, mesenteric glands, and kidneys. The skin presents a characteristic slaty-grey appearance, which may only be appreciable when seen by oblique light, and which is always most marked in uncovered parts. The hair also may be altered in tint and often has a peculiar reddish shimmer. The nails may shew a steel-grey lineation. The palms and soles are unaffected.

Maculae caeruleae (taches ombrées) are bluish spots about the size of a sixpenny-piece, found most commonly in fair-haired people, and limited to the tracks of the pediculosis pubis, namely, the groins, lateral

walls of the abdomen and thorax, and a line from the pubes to the axilla. They do not give rise to any symptoms, are not raised above the level of the skin, but are merely stains in the skin, which invariably result from the "bite" of the pediculus pubis. The colouring matter is derived from the human blood, but is altered, probably by the salivary glands of

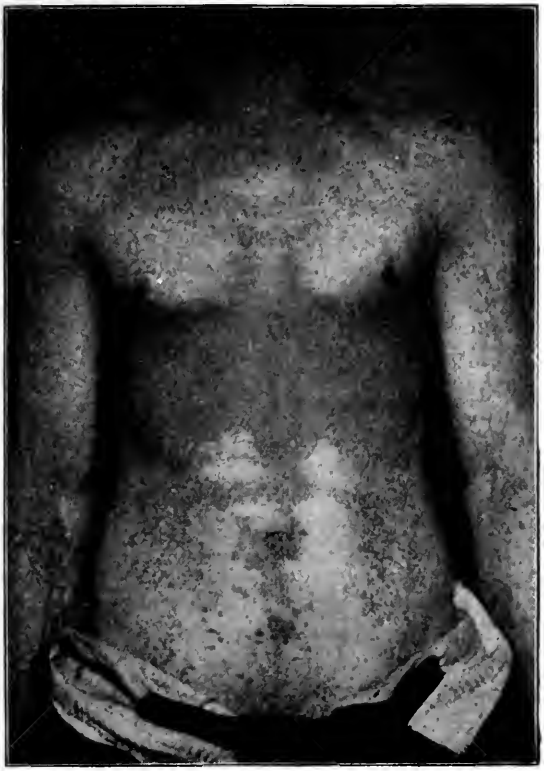

FIG. 123.—Tinea versicolor, characterised by pigmentation usually limited to the "vest area," and most marked on the chest and back. The pigmentation is diffuse, and due to the fungus *Microsporon furfur*. (Photograph by Dr. H. G. Adamson.)

the louse, before it is excreted (Oppenheim). The pigmentation rapidly disappears after the pediculi are exterminated.

A few words of special attention may conveniently here be drawn to an interesting condition generally known as the *Mongolian birth-mark*, which is a congenital bluish or greenish patch of skin, generally about the size of a five-shilling piece, situated over the sacral and coccygeal regions, and most commonly found in Japanese children at or soon after birth; it disappears in a short time. It was first described clinically and histologically by Bälz, who considered it a Mongolian characteristic, but Saabye, Adachi, Brennermann, Rivet, and others do not support this

view. In Ecuador the condition appears to be fairly common, and is known by the name of "esmeralda di famiglia," and is considered to be an indication of mixed breeding. Cases have been shewn in this country (Sutherland, Langmead).

The pigment is merely an increase of that naturally present in the skin, and it is interesting to note the permanent occurrence of the condition in some of the lower primates.

**Differential Diagnosis.**—The seat of the colouring substance in the skin distinguishes chloasma from pigments or pigmentations on its surface. Colouring matters applied—not very infrequently—by hysterical or designing women or by malingerers, to simulate disease or to excite sympathy, can always be washed off with soap and water, or a weak solution of hypochlorite of sodium. The discoloration resulting from chromidrosis (or seborrhoea nigricans) can be removed with ether or spirits of chloroform. Tinea versicolor and erythrasma produce brown but scaly patches, and the microscopical examination of scrapings reveals at once their characteristic fungi (see articles pp. 150, 152).

The pigmentation of Addison's disease may always be suspected by its localisation, especially on the mucous membrane of the lips, gums, and tongue, where its appearance is quite characteristic to the trained eye; the accompanying evidences of suprarenal mischief will of necessity settle doubts of diagnosis, although the pigmentary changes may be well marked when other symptoms are not, and *vice versa*.

Arsenical pigmentation leaves mucous membranes unaffected, is accompanied by hyperkeratosis, hyperidrosis, neuritis, or other evidences of arsenical poisoning, and is much more patchy than the diffuser pigmentation of Addison's disease, for which it is frequently mistaken.

Haemochromatosis, which is rare, is most likely to be confused with argyria which affects mucous membranes and is of a bluish or slaty tint rather than of the bronze-like coloration of haemochromatosis.

The pigmentation of Graves' disease does not present any peculiar characteristics, and can only be diagnosed by concomitant symptoms.

**Prognosis.**—Occasionally the pigmentation of symptomatic chloasma disappears, temporarily or permanently, after removal of its cause. As a general rule, however, the treatment of all forms of chloasma is unsatisfactory, the causal conditions being permanent.

**Treatment.**—Constitutional treatment depends upon the underlying causes, and need not be further discussed here.

The object of *local* treatment must be, of course, the destruction and removal of the epidermic layers of the skin, in the deepest of which the greater part of the pigment lies. Unfortunately, however, most—if not all—agents capable of effecting these objects are chemical or mechanical irritants, such as blistering or scrapings, which tend either, by causing congestion, to produce an increase of pigmentation after a time, or, by causing deep destruction of tissue, to result in indelible scarring.

Advice is generally sought for freckles as well as for chloasmic

patches on the face. The treatment of the former we have briefly referred to on p. 550.

For larger pigmentary patches the treatment is even less satisfactory. The following are the procedures most generally employed:—(i) Corrosive sublimate in almond emulsion applied several times daily, beginning with a solution not stronger than two grains to the ounce, and cautiously increased according to the tolerance of the patient's skin. (ii) A one per cent solution of corrosive sublimate in water or spirit, applied on lint carefully cut out to the size of the patch and maintained in position for several hours, which produces vesication; the epidermis is then removed and the subjacent surface dusted with some antiseptic powder. This method of treatment, advocated by the elder Hebra, requires very careful watching. (iii) The following substances, similarly applied, have all been recommended: acetic, boric, carbolic, citric, and hydrochloric acids; tincture of iodine; caustic alkalis. Of these carbolic acid is, in our experience, the most manageable and successful. (iv) Salicylic acid, either in plaster, plaster-muslin, or paste form, applied for twenty-four hours at a time, or as a saturated solution in alcohol applied repeatedly for several hours, is certainly one of the safest and most efficacious remedies for extensive patches. (v) Resorcin pastes (gr. x, cautiously increased to ʒj ad ℥j) are excellent, if temporary, remedies. They are the active ingredients in Unna's "scaling pastes." Plaster-muslins containing the same drug may be used for circumscribed patches. (vi) An admirable formula, which we owe to Unna, is as follows: ℞ Bismuthi oxychloridi gr. x, hydrargyri perchloridi gr. ij, hydrogeni peroxidi (10 vol. solution) ℥j, adipis lanae, vaselini āā ʒiv. It may be applied at night, or continuously, until the effect desired is produced. A useful adjunct to all the afore-mentioned measures is the preliminary use of a super-fatty peroxide of sodium soap prepared by Beiersdorf, the lather of which is allowed to remain on the affected part for some time before being washed off. (vii) Occasionally the use of the following sublimate collodion is justifiable: ℞ hydrarg. perchloridi gr. vj, spiritus etheris ʒiiss, collodii ʒi.

Tattooing.—The practice of tattooing is largely carried out in all countries, even among the highest classes and in persons of intelligence. The designs are usually coats-of-arms, allegorical figures, initials or names of beloved persons, and are sometimes of extraordinary complexity, if not of much artistic beauty. The "art" is especially cultivated in Japan, but is practised in wonderful perfection in this country also. It is unnecessary to describe the operation, which consists in introducing into the skin different forms of carbon (Indian ink), vermilion, and indigo, by means of various and even complicated instruments. No permanent yellow or green pigments have yet been discovered.

The practice is not unattended by danger. Mr. Thelwall Thomas records three very interesting cases of tattoo syphilis, the skin having

been moistened, previously to the insertion of the needles, by the saliva of the operator; and our own experience demonstrates that the accident is by no means rare. A considerable number of instances of inoculation of tuberculosis has also been recorded by competent observers. Warts and lichen planus, and cheloids may also arise from tattoo marks, and prove the source of much trouble and disfigurement, as from any other areas of defective skin.

**Treatment.**—No completely successful method of removing tattoo marks, short of excising them, has been discovered. A method, sometimes partially successful, consists in pouring a concentrated solution of tannin over the mark, re-tattooing with a bunch of needles, and then rubbing in nitrate of silver. Inflammation is thus set up, and after the separation of the scab a very superficial scar is left.

Many tattoo marks can be excised without leaving disfiguring scars, and in a certain number of cases the application of Thiersch grafts may be advantageous; the results thus obtained are excellent.

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Leucodermia (λευκός, white; and δέρμα, the skin).—Syn.: *Vitiligo; Acquired Achromia; Piebald Skin; White Leprosy.*

**Definition.**—An acquired disease of the skin, characterised by the appearance of white patches with convex outlines extending at the periphery, surrounded usually by hyper-pigmented skin, and often symmetrical in distribution.

**Etiology.**—Both sexes are equally affected. It is rare before ten years of age, but Crocker described a case in a girl aged four years. In a few rare instances it "runs in families." Exposure to the sun is held by many writers to be responsible for it in some cases, and thus to account for its frequency in negroes. On the other hand, it may result from exposure to extreme cold. Its start from a pigmented mole, from minute scars, or even from sites of pressure (for example, of studs) has often been observed. General depressing conditions, such as acute febrile diseases, not infrequently precede the appearance of leucodermia. Our experience coincides with Crocker's, that it generally occurs in

neurotic persons; and, as with locks of grey or white hair, its association with migraine, retinitis pigmentosa, morphoea, alopecia areata, and Graves' disease bears out the opinion that it may be of nervous origin—a trophoneurosis. On the other hand, a similar condition has been observed consecutive to the disappearance of patches of psoriasis, and Cavafy reported a case following an attack of jaundice, whilst Ehrmann has recorded a series of cases of leucodermia in which the phenomenon known as "dermographism" was well marked. These observations appear to support Ehrmann's view, that the condition is probably due to a toxaemia analogous to that of urticaria.

**Pathology.**—All are agreed that there is no pigment in the epidermis of the leucodermic area, but there is a difference of opinion as to whether pigment is increased in the surrounding skin or not. Increased it may be in some cases, but it is certainly rather the exception than the rule. Some observers describe changes in the corium—flattening out of the papillae, etc.; and Leloir and Dejerine believe they descried atrophy of the cutaneous nerves. Our investigations, however, do not confirm this. The most striking appearance is the presence of a small round-celled infiltration around the vessels, hair follicles, and sebaceous glands of the patch, which strongly supports the toxic hypothesis of its production. It is probable that this toxin so acts upon the cells of the epidermis as to prevent them from manufacturing pigment, that which has already formed being chemically altered in the natural course of events, but the question has been more fully discussed in our preliminary observations on pigmentary disorders.

**Incidence.**—This varies widely in different countries; it has been estimated at about 1·5 per 1000 in this country (Crocker). In the last statistical report of the American Dermatological Association it is returned as only 1 per 1000, despite the large negro population of the United States. Crocker quoted Garden's statistics in India as being 1 in 36; Erasmus Wilson's in London as 1 in 400; McCall Anderson's in Glasgow as 1 in 2500. Such statements are widely open to criticism. The affection is notoriously commoner in tropical than in temperate climates.

**Symptoms.**—In many—Crocker believed in all—cases an increased deposition of pigment precedes the appearance of the white patches. These are milky-white in colour, roundish or oval, or irregularly outlined; they gradually extend at the periphery, their margin being convex outwards. The line of demarcation between the patches and the surrounding skin is abrupt, and is accentuated by the increased pigmentation of the latter—more apparent, however, than real—which gradually shades off into the natural colour of the skin. By coalescence of adjacent patches extensive and variously figured depigmented areas may be formed; but the spreading margin is always convex, or festooned if several patches become confluent. The hair over the affected areas becomes white. Patches, which are often strikingly symmetrical, may appear on any part of the body, including the scalp; and spreading slowly, it may be

for years, may ultimately involve the larger part of the skin. In such cases the diseased may be mistaken for the healthy integument.

The condition is often more striking in summer, owing to the increased pigmentation of the normal skin; but some writers deny this, or even assert that the contrary is the case. It progresses irregularly, sometimes with periods of temporary arrest. When it is complete on any given part (for example, face or hands), it gives rise to but little disfigurement. Tactile, thermic, and pain sensibility over the parts are unimpaired, whilst recent careful experimentation shews that the sweat function is not interfered with. It is not, as a rule, accompanied by subjective symptoms, but we have seen a considerable number of cases in which itching was troublesome. In some instances pruriginous sensations precede the appearance of the leucodermic spots. We have also seen cases of very rapidly extending leucodermia of the type just described in persons suffering from severe syphilis, and completely differing in character from the condition previously referred to as the pigmentary syphilide. The occurrence appears to us to be more than coincidental.

FIG. 124.—Vitiligo, characterised by large white areas on an otherwise normally pigmented skin. (Photograph by Dr. H. G. Adamson.)

**Differential Diagnosis.**—This can seldom be difficult if the symmetry of the disease, its convex outer border, and progressive extension are noted, as well as the otherwise absolutely normal condition of the skin. In the tropics it may be mistaken for the pale areas which occur in nerve leprosy, but over these there is always more or less anaesthesia; thickening of nerves and other symptoms of leprosy would probably also be present. The margin, convex outwards, will distinguish leucodermia from chloasma. Not infrequently, however, the resemblance to morphoea may be considerable, especially when the latter is in its latest stage and is superficial. In morphoea the consistence of the skin is appreciably altered, being somewhat pergameneous; or, if atrophic, it is finely wrinkled, and characteristic patches in a less advanced condition can usually

be discovered. The same remark applies to lichen planus atrophicus, and to the rare condition of idiopathic atrophy of the skin (*vide* p. 567).

**Prognosis.**—Leucodermia is usually indefinitely progressive, but it may become arrested spontaneously. Reported cases of "cure" are almost certainly examples of complete extension of the disease.

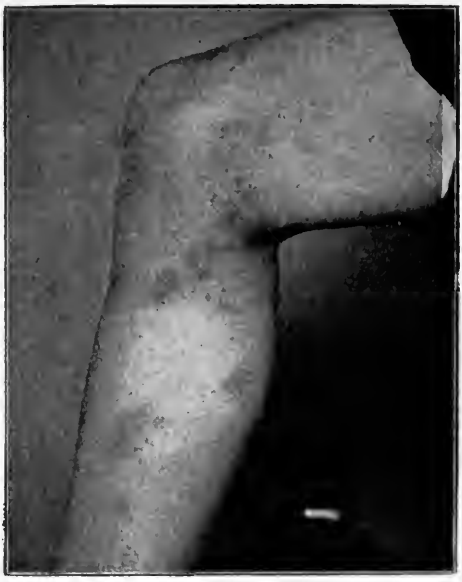

FIG. 125.—Pigmentation left after lichen planus. This is often very prominent on the inner side of the thigh and leg, and usually in the course of the veins, which are often varicose. (Photograph lent by Dr. H. G. Adamson.)

**Treatment** must generally be considered as unsatisfactory. Tonics and nourishing food may be recommended on general grounds.

Locally, various irritant applications may be used, perhaps chrysarobin is the best; or the patches may be stained with walnut juice. Bulkley states that good results can be obtained from centripetal galvanic currents, and we have assured ourselves of the efficacy of mild treatment with *x*-rays or of exposure to the quicksilver quartz lamp of Kromayer, although further evidence is desirable as to its permanency. The surrounding over-pigmented parts may sometimes be depigmented by the measures recommended for chloasma, with temporary benefit.

ALBINISM.—SYN.: *Congenital Leucodermia; Achromia.*

**Etiology.**—In exceptional cases albinism is hereditary, but most albinoes are born of healthy parents. Several albinoes often occur, however, in one family. It is certain that the progeny of a healthy person and an albino is generally normally pigmented. The condition is said in all textbooks to be endemic in some tropical countries (Lower Guinea, Loango), but no very convincing evidence on the point is forthcoming. Of the ultimate causation of albinism we know but little. It may possibly be due to some congenital metabolic derangement affecting the ferment tyrosinase.

**Symptoms.**—The sole feature of this condition is the congenital absence of pigment, which may be complete or partial. In complete albinism pigment is not only absent from the skin, but also from the hair, irides, and choroids; its subjects are called albinoes. The skin

appears white or pinkish in the parts where the vessels shew through. The hair is soft, silky, and quite white, or it may have a yellowish tinge; in one case (Folker) it is said to have been "red." The irides appear pink and the pupils red, the choroidal vessels not being obscured by normal pigment. For the same reason the retina is unprotected, and there is consequent photophobia. Nystagmus, nyctalopia, and nictitation also are always present. Albinoes are seldom of robust constitution, and may become tuberculous; they are often, too, of low mental calibre, but to this rule there are many striking exceptions.

Albinism in mankind is certainly commoner in coloured than in white races; it is frequent in the lower animals (ravens, rats, ferrets); many animals physiologically become white in winter. This, however, is not true albinism.

Partial albinism is a much commoner condition. It is more frequent, and, of course, more noticeable in negroes than in "white" people. The patches are often roughly circular in outline, and well defined; they may be symmetrical. They are commonest on the scalp, breasts, face, and genital regions. They do not usually increase with age. They may, like flat pigmented moles, be distributed in nerve areas, and therefore are generally classified by French authors as a-pigmentary "naevi."

Treatment is unavailing.

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## ATROPHY OF THE SKIN

By PHINEAS S. ABRAHAM, M.D., and J. E. R. McDONAGH, F.R.C.S.

As the atrophic conditions of the various appendages and of the pigment of the skin have been considered under other headings, the following remarks will be confined to those in which, diffusely or locally, the elements of the corium and epidermis are affected rather as a whole. From this restricted group, moreover, must be excluded the atrophies consecutive to other affections, or symptomatic of them, such as the syphilides, tuberculides, lupus erythematosus, leprosy, sclerodermia and morphoea, lichen planus and ruber, pityriasis rubra, some alopecias, favus, as well as Kaposi's disease (xerodermia pigmentosa), the atrophic skin of facial hemiatrophy, and the "glossy skin" (liodermia essentialis (Auspitz) or atrophodermia neuritica), which may be the result of other neuroses. Cutaneous atrophies on the site of injuries or ulcers,

cicatricial skin in general, and ainhum (*vide* Vol. II. Part II. p. 728), will also be excluded.

The atrophies to be considered here are therefore primary and idiopathic, or are, at any rate, not directly connected with other diseases or injuries of the skin.

False Atrophy.—In the group of idiopathic atrophies it has been the custom to include the so-called "congenital atrophy," which is only a hypoplasia or aplasia of the skin due to an absence of development of certain structures, such as the hair follicles and sebaceous glands, caused in some instances by intra-uterine injuries, and in others by constricting amniotic bands. Although not a true atrophy, since it is impossible to have an atrophy of an organ which has never developed, congenital atrophy is of sufficient interest to be included here, but, strictly speaking, it belongs to the group of "congenital defects of the skin."

**Congenital atrophy** may be diffuse or localised; the localised form is the more common, and was well shewn in the cases described by Riehl and Vörner, in which the atrophy was confined to two circular patches on the scalp. The areas were devoid of hair and of any trace of hair follicles. Histological examination proved that in the subcutis the hair follicles and sebaceous glands were entirely absent, and further, that the subcutaneous fatty tissue had not developed. In Hebra's and Tendlau's cases the atrophy implicated practically the whole surface of the body.

Under the developmental anomalies of the skin should also be included the condition, described in Hebra and Kaposi's textbooks under the name of "Zweite Art von Xeroderma" or atrophodermia albida, in which the skin of the thighs and occasionally of the forearms and hands is thin, partly stretched, difficult to raise, and pale in colour; the epidermis is extremely thin and wrinkled, and has the appearance of gold-beaters'-skin. In all the recorded cases, the condition is stated to have existed from the earliest childhood. No case has been noted since Kaposi's time.

**The striae and maculae distensae**, which appear after childbirth or in any condition accompanied by a rapid increase or diminution of the subcutaneous fat, must also be excluded from the true atrophies. The striae have frequently been observed to occur after an attack of enteric fever; but whatever their origin, they are all caused mechanically, resulting in a tearing of the elastic fibres. Such disappearance of the elastic fibres may also be brought about by pressure.

**Senile atrophy of the skin** is due to the same metabolic disturbances, and altered relations of waste and repair, which are characteristic, more or less, of all the tissues of the body in old age, and is a degenerative process (*vide* also Vol. I. p. 194). The skin becomes thinned, wrinkled, loose, dry, yellowish or more darkly pigmented, and especially prone to degenerative changes, sebaceous warts, angiomatous, fibromatous, and carcinomatous growths, and the like; subjective sensations, especially cold and pruritus, are also frequently present. All the elements of the skin may be simply atrophic, and equally affected, or some more than

others; or degenerative, granular, fatty, colloid, hyaloid, or other changes may be confined to one or more of its parts. According to Neumann, the fibrous tissue of the senile skin may undergo a coarsely granular, a finely granular, or a vitreous degeneration, as well as general atrophy or shrinking, with more or less atrophy or degeneration of the epithelial, nervous, and muscular elements, and flattening of the papillae. The hair follicles are shortened, the sebaceous glands dilated, the capillaries enlarged, and pigment accumulates irregularly in the thinned epidermis. According to M. B. Schmidt and Reizenstein, the main degeneration is in the elastic fibres; Unna states that there is a considerable collagenous as well as elastic change, substances which he calls "collacin" and "elacin" being formed. The last-named observer did not detect any degeneration of the muscles.

TRUE ATROPHY.—This group contains the true idiopathic atrophies of the skin.

**Atrophia Cutis Idiopathica Progressiva.**—Taylor described the first case in 1876 and Buckwald the second in 1883; up to 1908, when Róna discussed the subject before the Tenth German Dermatological Congress, only 70 cases were on record. The disease is commoner in women than in men; it usually starts about the fortieth year, and many years may elapse before the condition reaches its acme. It has, however, been described in patients of sixteen to twenty years of age.

*Morbid Anatomy.*—Whether the disease commences clinically with the signs of inflammation or not, they are always visible histologically. The epidermis as a whole is thinned and the papillary arrangement is lost; so that the line of separation between the epidermis and cutis is nearly straight. The collagenous tissue is atrophic, but in the upper layers of the cutis it appears quite homogeneous, swollen, and has lost its fibrillar arrangement. The elastic fibres in the upper layers of the cutis have completely disappeared, and in the lower layers they are rarefied. The blood-vessels are dilated, the capillaries are increased in number, and collections of mononuclear cells, containing in some cases many, in others only a few, plasma cells, infiltrate the connective tissue and are mainly perivascular. The hair follicles, sebaceous and sweat glands are atrophic, and the subcutaneous fat has completely disappeared.

*Clinical Picture.*—The limbs are generally affected symmetrically, first the lower, then the upper, commencing either on the dorsum of the foot or around the ankle-joint, spreading up over the knee as high as Poupart's ligament in front and over the glutei behind. The upper extremities are also affected, the condition starting on the backs of the fingers or hand and spreading up as far as the shoulder. Not infrequently the lower limbs are the only parts attacked. The extensor surfaces are invariably more affected than the flexor; the bends of the elbows and knees, the palms of the hands, and soles of the feet are generally free; Touton, Rusch, and Pospelow have described cases in which both the palms and soles were affected. In a case of Holder's the disease spread to the

genitals, reaching as far as the lower part of the vagina; extension to the trunk is also extremely rare, but cases have been recorded (Neumann, Kreissl, Rusch).

The disease begins with red and bluish-red areas; the former are bright red, sharply circumscribed, become pale on pressure, and are covered with very fine scales; the latter differ in not being sharply circumscribed. The red areas give the impression of being inflammatory, and the blue of being cyanotic. The backs of the hands, the dorsal surfaces of the feet, or the elbows and knees are the first parts to be affected. The earliest areas gradually increase in size, become confluent, and are joined by fresh lesions at the periphery.

Anomalous cases have been described by Baer, Kreissl, and others in which the disease started as small papules of a yellowish colour, but it is not clear that they should be classified as true atrophy. Bettmann's three most interesting cases, in which the atrophy started as a vitiligo, are also on a different footing. Jarisch had previously drawn attention to the slight inflammatory and atrophic changes in the pars papillaris, which he had observed and regarded as characteristic of vitiligo. Marc had also observed changes in vitiligo which were indistinguishable from those found in early atrophy of the skin. The slight inflammation, which so often precedes vitiligo, is almost invariably a prodromal sign of idiopathic atrophy.

In rare instances the inflammation may be extremely prominent, as in a case described by Blaschko, in which it produced oedema. In a case described by Krzysztalowicz the skin of the whole of the right leg was markedly infiltrated, shiny, and stretched. The symptoms are slight, are far more often absent than present, and seldom amount to more than itching and burning sensations.

The clinical appearance of the mature condition is very characteristic. The skin is dark red, bluish-red, or brownish-red, depending upon the increase of pigment in some parts and its absence in others. The skin is considerably thinned and transparent, so that the underlying veins, tendons, and nerves are clearly visible. The skin is wrinkled, easily movable, and there appears to be much more than is necessary to cover the underlying structures. The skin is dry and inelastic as a result of disappearance of the subcutaneous fat, and is covered with fine scales, which become specially noticeable when the surface is rubbed. The wrinkling of the skin is most prominent where it is normally lax, namely, over the backs of the hands, knees, and elbows. In about a third of the reported cases the changes in the skin of the feet and anterior surface of the tibiae differ somewhat from those mentioned above. The skin is tense instead of lax, but is nevertheless in folds which cannot be raised off from the subjacent tissues.

The surface is either smooth or rough, of a yellowish-white appearance, and there is usually a reddish-brown zone between the normal and the affected skin. It resembles sclerodermia so closely that this diagnosis is not infrequently made. As might naturally be expected,

the function of the atrophied skin is altered; the secretion of sweat produced on healthy skin by injections of pilocarpine fails, and the "goose skin," induced by the application of an ether spray, is, as a result of the disappearance of the arrectores pilorum, delayed (Oppenheim).

Pick's erythromelie and Neumann's erythema paralyticum are the initial stages of idiopathic atrophy of the skin, and were eventually regarded in this light by these authors.

*Differential Diagnosis.*—Many of the cases which have been described under the heading of idiopathic atrophy of the skin really belong to Brocq's *érythrodermie*; in a well-known case of Kaposi's the skin all over the body became swollen and red and was accompanied by enlargement of the lymphatic glands and profuse diarrhoea, from which the patient rapidly died. Matzenhauer quotes a case with localised areas of skin which resembled cigarette paper, were brownish in colour, and were covered with fine scales. Many such cases of what is really Brocq's parapsoriasis *en plaques* have, on account of the fine wrinkling of the skin, been regarded as idiopathic atrophy. Whenever increase in size of the papillary bodies, due to cellular infiltration which stretches the epidermis, is succeeded by diminution, fine wrinkling of the skin results. Alexander's cases of atrophy of the skin, in which the change was preceded by bullae and accompanied by disappearance of the nails, are probably examples of epidermolysis bullosa, the atrophy of which is secondary and not unlike that found in lupus erythematosus.

**Acrodermatitis Chronica Atrophicans.**—This condition, first described by Herxheimer and Hartmann, is characterised by a localised atrophy, in which the skin is lax—an anetodermia—and is preceded by a well-marked inflammatory infiltration.

Finger, up to 1910, was only able to collect 50 cases. Out of 48 cases 26 were women and 22 men. The age at which the disease began was the same in the two sexes, namely, about the fortieth year.

The limbs are the parts chiefly affected, especially the upper, but Klingmüller described a case in which the nose and cheeks were attacked, and Herxheimer and Hartmann one in which the soles of the feet were implicated. The earliest change is a soft infiltration of either a pale red, cinnabar, or bluish-red colour, resembling erythema nodosum; but the nodules are not so sharply circumscribed or so raised as those met with in that disease. After the inflammation has subsided somewhat, the red colour gives place to a yellowish hue, and closely resembles sclerodermia.

The lesions shew preference for the elbows, backs of the hands and fingers, and ulnar surfaces of forearms, and appear in the form of nodules, or in parallel bands. On the lower limbs, the dorsal surface of the feet and the knees are most generally involved. When the inflammation has completely disappeared, the skin becomes wrinkled and transparent, and in every way resembles the changes described under idiopathic atrophy.

Usually the subjective symptoms are slight, but in some cases the pain is so severe that owing to the similarity of the clinical appearance the diagnosis of erythromelalgia has been made.

Although a distinction is drawn between diffuse idiopathic atrophy of the skin and acrodermatitis atrophicans, it must be remembered that they have several features in common, and in the cases recorded by Róna and Metschersky the two conditions appeared simultaneously.

**Atrophia maculosa cutis**, also an anetodermia, is characterised by circumscribed areas of atrophy of the skin, round or oval, which vary in size from a hazel-nut to a penny.

In the first instance there is a swelling, over which the skin is wrinkled; the swelling feels soft and somewhat empty, as if it were a tiny sac filled with fat.

Sometimes the disease commences as wheal-like, non-pruritic, inflammatory nodules in the skin of the trunk, which persist for a long time, and ultimately become atrophic (Pellizzari). Balzer and Reblaud cite a case of nodules occurring in the skin of the trunk which resembled erythema nodosum, and gradually became atrophic. The patient also shewed marked dermographism.

Cases have been described in which macular atrophy has followed on urticaria-like papules (Jadassohn, Colcott Fox, M. Morris). In a case shewn by one of us (P. S. A.)at the Dermatological Society of Great Britain and Ireland in 1899, under the name of "Atrophodermia guttata," the lesions were very small, 2-3 mm. in diameter, and apparently began as telangiectatic spots, which became raised and indurated, and then atrophic. They were thickly scattered over the neck and shoulders of a young woman.

*Differential Diagnosis.*—Many cases described under this heading are really cases of morphoea, or localised sclerodermia, which can always be identified by its yellowish appearance and smooth surface somewhat depressed below the surface, and in its earliest stage surrounded by a red or lilac zone. Moreover, morphoea sometimes responds to treatment, whereas atrophy remains unaltered.

On account of the sac-like appearance of the initial lesions in most cases the diagnosis of von Recklinghausen's disease is often made, but von Recklinghausen's disease is a new growth, a neuro-fibromatosis, and is unmistakable histologically (*vide* Vol. VII. p. 369). Further, true tumours are found elsewhere, scattered areas of pigmentation are the rule, and the disease is often hereditary and starts in early life.

These idiopathic atrophies have also been confounded with cicatricial conditions following traumatic or other lesions, such as those of acne and syphilis, with the atrophic stage of lichen planus, and with xerodermia or the slighter forms of ichthyosis.

*Pathology.*—The histology is identical with the other two forms already described; but there are some changes which take place in the final stage, characteristic of true atrophy, requiring special mention.

In a section taken through a "sac" the cutis is found to consist of a network of fine fibres, quite analogous to fat-tissue. The papillae over this island of fat have quite disappeared and the epidermis is thinned.

This network does not differ in any way from the network of the

subcutaneous fat. The elastic fibres shew a gradual decrease of the elastin to its complete disappearance in the centre. The elastic fibres of the sweat and sebaceous glands and vessels remain.

In a further stage the connective tissue is very loose and degenerate, so that the vessels and hair follicles look as if they were lying in space. In many parts of the cutis there are islands of fat, and a direct continuity between this fat and that in the subcutis can be made out. The fat in the cutis is undoubtedly due to a fatty transformation of the connective tissue.

Sometimes the acrodermatitis ends in tumour-like formations, histologically consisting of an increase of fibrous tissue, which is often perivascular, leading to a marked thickening and dilatation of the veins. Oppenheim considers that this varicose condition, which it really amounts to, depends upon a loss of elastic tissue, which decreases the resistance, and so leads both to an increase in width and length of the veins. The deposit of haemosiderin in the connective tissue points to rupture of some of the vessels, such as is known to occur in varix.

When acrodermatitis atrophicans affects the dorsum of the foot and the region of the ankle-joint it often bears an extremely close resemblance to sclerodermia, and a histological examination may be the only means of distinguishing them. The absence of elastin, which is so characteristic of acrodermatitis atrophicans, does not occur in sclerodermia. The rich perivascular plasma-cell infiltration and dilatation of the vessels, the straightening out of the papillae, the most obvious changes in acrodermatitis, are not found in sclerodermia.

Cases have been described of the simultaneous occurrence of acrodermatitis atrophicans and sclerodermia, especially over bony parts, and many observers consider that acrodermatitis atrophicans may be a terminal stage of a sclerodermia, but in the cases said to bear this out histological examination has been omitted; and Oppenheim maintains that if a microscopical examination be made the distinction between them is quite clear. The probable explanation of the sclerosing process in the above is that, as there is only periosteum between the skin and the bone, fibrous tissue quickly forms.

**Etiology.**—The cause of true atrophy is very far from clear; from its inflammatory nature it probably depends upon some specific toxin.

In Holder's and Malinovski's cases the disease commenced at the menopause, and Bäumer had a case in which atrophy began after the birth of a child. Finger considers that the weather has a great influence, and supports his contention with the changes in the skin which Freund and Oppenheim proved often occur after *x*-rays; it is true that *x*-ray dermatitis not infrequently ends in sclerodermia-like changes which closely resemble those in idiopathic atrophy. In addition, xerodermia pigmentosa commences with an erythema solare, and "sailor's skin" is known to be due to the prolonged action of the sun's rays.

**Treatment.**—Medicinal measures are of no avail. Where the skin is firmly bound down to the periosteum and bone, for example around the

ankle-joint and impedes the patient's progress, much can be done by massage with emollients, and especially by trying to pinch up the skin from the subjacent structures.

**Kraurosis Vulvae.**—In connexion with the cutaneous atrophies, this affection may be alluded to. Attention was first called to this disease by Breisky in 1885, and other cases have been recorded by Heitzmann, Janowsky, Ohmann-Dumesnil, and others. The main feature is an atrophic condition of the female genitals, usually accompanied by extreme pruritus. The *labia minora* and prepuce are particularly affected; but the atrophic changes may extend to other parts of the vulva, and considerable stenosis may result. Patches of leucoplakia on the mucous membrane are often seen, and an eczematous condition may ensue from the constant scratching. The affection has been met with in unmarried as well as in married women, young or old. Leucorrhoeal discharges are common in these cases. The etiology of the disease is not definite, and the treatment is generally disappointing. Curetting has been recommended, and even excision of the parts, especially in view of the possible development of squamous-celled carcinoma. In one case at the West London Hospital antipruritic applications gave great relief.

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AINHUM—*vide* art. Vol. II. Part II. pp. 728-731.

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## TUMOURS OF THE SKIN

By A. WHITFIELD, M.D., F.R.C.P.

TUMOURS of the skin may either arise primarily or may be secondary to a tumour in some other part of the body. In our present ignorance as to the causation of tumours it is somewhat difficult in certain instances to know what to include and what to omit. Thus, the simple venereal wart is certainly due to contagion or the irritation of an infective discharge, and yet it is usually described as a tumour, whereas the syphilitic condyloma, also warty in structure, is excluded from the category of tumours.

New growths may be formed from almost any of the constituent parts of the skin, and they are usually classified according to their histological origin.

A. *Innocent Tumours.*

Derived from the epithelium.

„ „ surface: warts and horns; moles; benign epitheliomas.
„ „ hair follicles: tricho-epithelioma or epithelioma adenoides cysticum.
„ „ sebaceous glands: adenoma sebaceum.
„ „ sweat glands: syringo-adenoma, intra-canalicular papilloma.
„ „ fibrous tissue: fibroma, neuro-fibroma.
„ „ elastic tissue: pseudo-xanthoma elasticum.
„ „ muscle tissue: leiomyoma.
„ „ blood-vessels: angioma.
„ „ lymphatics: lymphangioma circumscriptum.

Consisting of bone: osteoma.

B. *Malignant Tumours.*

Derived from the epithelium.

„ „ surface: squamous-celled carcinoma, some cases of rodent ulcer, Paget's disease of the skin, melanotic carcinoma (secondary to moles).

„ „ appendages: rodent ulcer.

„ „ fibrous tissue: sarcoma.

„ „ vessel-walls: endothelioma.

## Innocent Tumours

**Warts** (Verrucae).—Three main forms of wart occur on the skin, namely, (i) the common flat-topped wart, which may be either considerably raised above the surface or may be so nearly on the general skin level as to be obvious only in a side light (plane warts); (ii) the filiform and fungiform warts (condyloma acuminatum), which always form as projections of one or more digitate processes; and (iii) the senile or seborrhoeic wart.

The *common wart*, of which the plane wart is probably only the less fully developed form, appears as a rough projection rising abruptly from the level of the normal skin. It is pale in colour and the surface is either of a light translucent yellow owing to the thickness of the horny layer, or blackish from the accumulation of dirt. If of large size, the side of the base may be seen to be of a pale pink, and the surface is always rough, and may be recognised with a lens to be composed of many horny points. It occurs most commonly on the hands and lower parts of the forearms of children from the age of five to sixteen, is frequently multiple, and is not uncommonly associated with the acuminate variety. There is often a single chief wart of longer duration than the rest, around which many smaller ones are irregularly grouped. Where the small plane warts predominate they are often grouped in short straight lines running in various directions and suggesting inoculations along scratch marks.

Histologically a wart is composed of a greatly hypertrophied epithelium lying upon long narrow papillae with fine capillaries running up to supply them. The mucous layer is considerably thickened (acanthosis), and mitosis is found, though not abundantly, throughout its depth. In the earlier stages the cells are swollen and irregular and intermingled with leucocytes. The horny layer is extremely thick, the cells pass through the usual stages of keratinisation, and the process seems to be merely an excess of the normal. It is probable that the extensive keratinisation is associated with the comparatively poor vascularity. There are generally some signs of irritation in the corium below, possibly due to the friction and slight trauma to which the warts are exposed, but inflammation is not a prominent feature. The line of demarcation between the epithelium and the corium is not greatly disturbed in a

downward direction, almost the whole of the new growth being formed above the general skin surface.

The *acuminate* wart occurs frequently on the genitals, both male and female, where it is almost always associated with an irritating, usually gonorrhoeal, discharge. It also occurs on the head and is very commonly accompanied by pityriasis and seborrhoea of the scalp. It is also frequently seen on the face and neck in children. In dry situations the wart is of a light pink colour, and forms a fleshy mass of variable size, usually somewhat constricted at its base. Even with the naked eye the finger-like processes can be easily distinguished and are usually capped with a yellowish and fairly hard horny layer. In moist situations, such as the vulva and prepuce, the warts are bright red, the horny layer is macerated off, and an offensive mucoid discharge accumulates between the lobes of the growths, which are delicate and bleed easily upon the slightest violence.

FIG. 126.—Photomicrograph of section of acuminate wart shewing enlarged papillae with great overgrowth of the stratum mucosum. ×40.

Histologically this type of wart (Fig. 126) consists of enormously dilated, clubbed, and often compound papillae containing very large capillary vessels, surmounted with an extremely thick mucous layer shewing rather abundant mitoses, and covered with a horny layer of only moderate thickness except at the tips of the processes where, probably on account of the greater distance from the blood-supply, keratinisation is more extensive. There is always a considerable increase of the mononuclear cells of the corium and some increase in the polymorphonuclear leucocytes, some of which may be seen migrating through the inter-epithelial canals of the epidermis.

The third variety, *the senile* or *seborrhoeic wart*, is most usually found, as its name implies, in elderly people or in those with greasy skins. It occurs chiefly upon the trunk, but is also found on the backs of the hands and the face, especially the forehead. It appears as a very slightly raised circular or polycyclical growth, usually of a dark colour from adherent dirt. The surface on close examination may be seen to be rough and faintly pitted, and on scratching it a whitish greasy pulp may be scraped off and a little bleeding often follows.

Histologically the papillae are slightly enlarged and the epithelium,

especially the horny layer, is moderately thickened. There are always some signs of chronic inflammation in the form of a mononuclear-cell infiltration, and in some specimens I have observed that the sebaceous glands have undergone a hyaline transformation. The exact relation of this form of wart to seborrhoea is not known, but in young people it is almost always accompanied by excess of secretion, and is distributed in the triangular area on the back which is the common seat of seborrhoea. In elderly people this association with seborrhoea is not so common, and the warts are more frequently found on the hands, arms, and face in the old than in the young.

Malignant transformation sometimes occurs in the warts of old people, and takes the form of multiple squamous-celled carcinomatous tumours (the so-called *épitheliomes sebacées* of French writers).

*Horns* are rare tumours of the skin, and there is some doubt as to what lesions should be included under the name. Dubreuilh divides them into three classes, namely, ($\alpha$) the filiform horn 5-10 millimetres in length, which would, I think, correspond to that already described as the filiform wart; ($\beta$) the cutaneous horn proper; and ($\gamma$) the juvenile horn. The last he regards as closely related to the systematised naevi, and in this country it would be classed with the hard moles, or as ichthyosis hystrix. In this place, therefore, only the cutaneous horn proper of Dubreuilh's classification needs description.

Cutaneous horns are formed of a brownish-yellow, rather greasy, and very tough material; they vary a good deal in both length and thickness, being sometimes as much as three-quarters of an inch thick, and seven or eight inches long; they are generally curved or spiral; the surface is ribbed longitudinally, and often shews somewhat irregular transverse bands. On section, the centre, especially near the root, is found to be filled with a greasy, degenerated detritus which has an extremely offensive smell. As a rule the horn grows from the wall of a sebaceous cyst after rupture of the cyst. In one recorded case the horn grew without rupture of the cyst wall which it pushed in front of it. Horns are also said to be occasionally formed from excessive accumulation of the corneous material on ordinary warts. Horns develop occasionally also on scar tissue, and I have seen one case in which they appeared on the atrophic areas left by the eruption of lichen planus.

The development of the horn is usually very slow and is not infrequently interrupted by its detachment, either spontaneously or more commonly by injury. Malignant transformation may occur with the formation of a squamous-celled carcinoma. Histologically the horn may be divided into the base and the excrescence. The base consists of very long and extremely narrow papillae with wide interpapillary processes of epithelium between. The papillae contain rather wide capillaries with only the slightest amount of fibrous tissue surrounding them and intervening between them and the epithelial cells. The interpapillary processes are often contorted and extremely irregular, and there may be cell-nests buried in them so that in section the growth often closely resembles a

squamous-celled carcinoma. The excrescence is built up of normal and abnormal horny cells and is often more or less hollow, being filled to some extent with fatty and degenerated cells among which are growing many organisms, the bottle bacillus being the most abundant. Occasionally the pressure of the interpapillary epithelial processes and the overlying horny material causes thrombosis of the capillaries and death of the tips of the papillae, which are then thrown off into the excrescence and are found in the body of the horn later.

The *etiology* of warts is still obscure. In some forms of warts (not syphilitic) spirochaetes have been found, but their causal relation has not been proved. Most warts are certainly contagious from one part of the individual to another, and slightly so from one person to another. The soft filiform and fungiform warts are often associated with seborrhoea and simple pityriasis. The moist warts of the genital regions are almost invariably associated with an irritating discharge (hence the name gonorrhoeal warts), but they are probably also contagious. Mention must be made of the peculiar epithelial hypertrophy occurring in sweeps and workers with tar. In these cases there may be small ordinary warts, but in addition a massive acanthosis and hyperkeratosis of the follicle walls may develop and form tumours as large as a grape ("tar mollusca"), which partly project above the surface and are partly included in the corium. Many of these slough out and heal, but some undergo malignant transformation, so that it is better that all should be removed. With the improved hygiene and cleanliness of modern days these warts are much less common than in the past.

*Treatment.*—Internal treatment by means of lime water, magnesium salts, and arsenic has been recommended; but all often fail, and it must be remembered that warts are very capricious, sometimes disappearing spontaneously in a very short time.

Local treatment is of much greater importance than internal, and there are many fairly trustworthy methods. It is better to divide the growths for purposes of treatment into the common form, the fungiform and filiform moist warts, the seborrhoeic form, and the cutaneous horn. Common warts, when single or few in number, may be painted daily with 10 per cent salicylic acid dissolved in collodion, and scraped with a blunt knife after soaking in hot water every three or four days. I believe that this treatment, if thoroughly undertaken, will invariably cure warts, but the corrosion must be carried to the point of exposing and destroying the dilated capillaries. This causes slight pain, and the patient is apt to stop treatment just when the cure is likely to be obtained. When multiple they may be electrolysed with a flat carbon electrode covered with an absorbent pad saturated with a 2 per cent solution of magnesium sulphate. The positive pole should be used for the warts, and a current of 5 to 10 milliamperes passed for ten to twenty minutes. In a good many cases *x*-rays have been used for the removal of multiple warts. A series of small exposures, or two or three of Sabouraud's pastille doses at intervals of three weeks may be given. I

have had numerous successes with this method, but in two cases I was quite unable to effect a cure. This is, in my experience, the most satisfactory method in the large crops of painful gonorrhoeal warts of the penis and vulva. When *x*-rays are not available, moist warts may be treated with strong (10 to 30 per cent) resorcin solution, or a saturated solution of alum, but both are very painful.

For the long filiform warts of the scalp and face I find that the galvano-cautery is most effective. The wart should be grasped lightly with a pair of forceps, pulled up gently, and the neck cut through with the cautery. Tar mollusca, all large fungating warts, and cutaneous horns should be excised with an elliptical incision and the wound sutured.

**Moles.**—In England the name mole is usually applied to the cellular tumours of congenital origin associated with more or less pigmentation, and often with excessive growth of hair. In Germany all congenital growths are known as naevi (the term usually restricted to congenital angiomas in this country), and are classified according to their structure. Moles are so common that it would probably be difficult to find any one who has not one at least, but in some cases very large pigmented and hairy moles occur, and more rarely the greater part of the skin may be involved in mole growth. Not infrequently they are attributed to maternal impressions. Moles may be divided into (*a*) the common soft mole in which the new growth lies buried in the skin, and (*b*) the rarer papillary mole in which the growth forms a papillomatous excrescence above the surface.

(*a*) *Soft moles* may be almost flat, but are more commonly raised, and they often vary in prominence from time to time owing to changes in the vascular supply and consequent turgescence. When small they are generally hemispherical smooth projections varying in colour from a light yellowish-brown to almost black, and they frequently carry long and coarse hairs. When large the surface is slightly irregular, and shews pits corresponding to the orifices of large sebaceous glands. They occur in any region of the body, but certain regions, such as the angle of the ala nasi and the line from the angle of the mouth to the external auditory meatus, are sites of predilection.

Microscopical Examination.—The surface epidermis for the greater part of its extent is normal, or perhaps shews a slight increase of pigment in the deeper layers. In places, however, it will be seen that there are more deeply pigmented areas corresponding to the interpapillary ridges, in which the cells have lost their fibrillae and have become smaller and more indeterminate, often lying loose in a cavity contained in the epidermic ridge (Fig. 127). Here and there actual down-growth of the ridge is noticed with snaring off of portions of the changed epithelium so as to form an alveolar growth of cells in the corium below. These changes are most marked in the moles of very young children, and in adults the process has nearly ceased, though it can generally be found here and there. Deeper in the corium there are numerous alveoli of large oval cells with vesicular nuclei closely resembling those which are seen in the

act of being snared off from the surface. Some of these cells are separ-

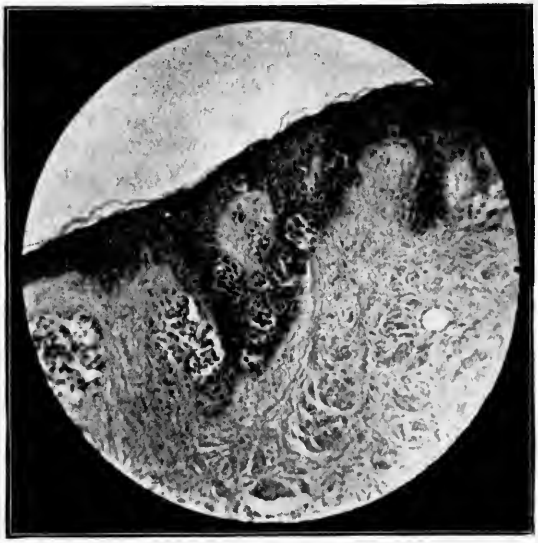

Fig. 127.—Photomicrograph of surface of mole shewing genesis by loosening and down-growth of epithelium. × 250. Compare with Fig. 135 of Paget's disease.

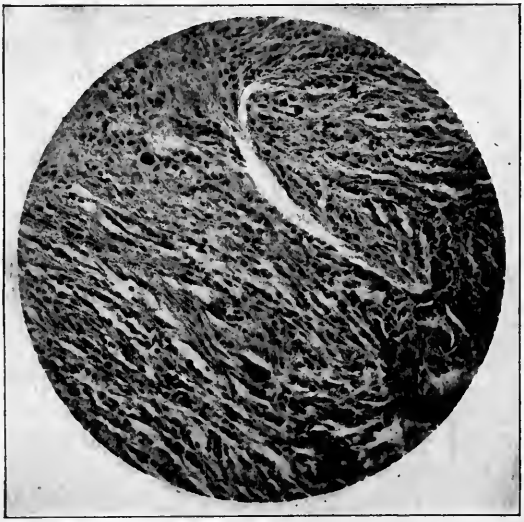

Fig. 128.—Photomicrograph of deep part of the mole shewn in Fig. 127, shewing endothelioma-like structure which has led to confusion. × 250.

ated off from the main alveoli, and either lie alone or are arranged in cords, so that they closely simulate the structure of endothelioma (Fig.

128); but careful examination of the mode of development and growth has proved that the cells are derived from the epidermis. Occasionally among the mole cells there are giant cells of considerable size, but these are by no means constant. Pigment varies considerably in amount and may be partly extracellular, but is for the greater part contained in rather large cells which are scattered among the simple mole cells. The pathological anatomy and development of these moles is of some interest and importance, as they not infrequently give rise to malignant tumours which have been usually described as melanotic sarcomas, though in reality they are carcinomas (*vide* p. 602).

(*b*) The *papillary mole* occurs either singly, which is very uncommon, or more frequently in long streaks and patterns suggesting some nerve distribution, hence it has been described under various names (Naevus nervosus, naevus unius lateris, and ichthyosis hystrix). The clinical appearances of the tumours are characteristic (Fig. 3*a*). They consist of papillomatous growths sometimes quite soft to the touch, sometimes (cases diagnosed as ichthyosis hystrix) very hard and carrying a considerable horn on the surface. Microscopically they shew thickening of the epidermis, which is thrown into unusual folds, but no submerged tumour formation such as is found in the common soft mole.

The *treatment* of moles varies according to the size of the growths, and it is obvious that where, as is sometimes the case, vast areas of the skin are involved, no treatment is of any avail. It is probably better either to leave moles quite alone or to remove them completely, in view of the possible stirring up of any malignant tendency by simply irritating them, and for this reason all moles subject from their position to frequent or chronic irritation, or those shewing any sign of active growth in adult life, should be excised.

Large moles, then, if treated at all, should be excised, and the area covered in with Thiersch grafts, if necessary. Small moles may be treated by electrolysis, the galvano-cautery, or liquid air, the last-named method being described under the treatment of angioma (p. 588). If electrolysis be chosen the negative pole should be used, connected with a stiff iridio-platinum needle. Any coarse hairs, such as are so frequently found, should be first destroyed by catheterising the follicles with the needle and passing the current. After this has been done, the needle should be pushed through the growth from the periphery in various directions, the circuit being closed after the introduction of the needle by the patient's grasping the positive pole. A current of three milliamperes is sufficient, and the procedure should be continued until the whole mole is distended into a tense pale swelling. This swelling subsides in a few hours, and the growth dries up into a scab which falls off and leaves very little scar. If the galvano-cautery be preferred the operation is still simpler. With a ball-pointed cautery at a dull-red heat the whole of the little growth is charred away, care being taken to allow the part to cool from time to time, so that the charred mass of tissue does not cause further destruction by acting itself as a hot body embedded in the tissues. Repeated

exposure to the radium button will also often cause the disappearance of small moles.

**Epithelial Growths of the Hair follicle, Tricho-epithelioma, Epithelioma adenoides cysticum, Acanthoma adenoides cysticum** (Brooke).—This is a very uncommon affection of the skin of the face, usually occurring in females and often running in families. The clinical appearances are as follows:—Small pale nodules resembling ordinary milium are embedded in the skin surrounding the eyes and that of the naso-labial fold. They may also occur less abundantly on the scalp, forehead, chin, and neck. The tumours usually begin to appear about the time of puberty, and grow and multiply rapidly for a few years, after which the tendency is to become stationary.

*Microscopically*, the tumours consist of lobed down-growths of epithelial cells with large nuclei and a protoplasm devoid of prickles. The cells in the centre of the lobes are closely packed and oval in shape, whilst those at the periphery are arranged in a palisade. In some tumours cystic cavities are found, and the growth involves and appears to spring from the walls of the hair follicles; in others connexion with the surface has been demonstrated. The whole of the tumour is sharply limited by a somewhat dense layer of fibrous tissue, and there is no sign of infiltration of the surrounding corium by the epithelial lobes, nor is there any marked infiltration with mononuclear cells. In some reported cases the tumours have been found to be tricho-epithelioma mixed with hidradenoma. By these characteristics the tumours may be distinguished from those of rodent ulcer, which otherwise they closely resemble. The tumours may be destroyed with a fine cautery or by electrolysis.

Nearly related morphologically are those tumours of the scalp which have been called benign epithelioma and endothelioma. A number of these tumours have now been published, and the opinions as to their nature vary widely. The tumours appear at different ages and affect both sexes, not infrequently occurring in more than one member of the same family. They appear as more or less spherical or lobed swellings of pinkish-red colour, and vary in size from that of a small pea to that of an orange. They lie in the skin itself, and are slightly movable on the deeper tissues. The surface is sometimes shining and sometimes slightly pitted by the patent hair follicles from which the hair is lost.

This form of tumour appears to occur only on the scalp, and is peculiar in occasionally undergoing spontaneous atrophy, hence the name "withering sarcoma of the scalp" originally applied to it by Morrant Baker. Its occurrence in families is in favour of its congenital origin.

It is, of course, impossible to be positive that all the cases described under the various names by different authors were of the same nature, but the disease is so peculiar and characteristic in its clinical features that it is a justifiable assumption.

As has already been stated, the tumours have been considered to be sarcomatous, endotheliomatous, or epithelial by various observers, a state of affairs which corresponds fairly closely to the different views

which have been held as to the origin of moles. Dubreuilh's careful researches have, however, in my opinion, settled the question in favour of the epithelial nature of the growth. Microscopically this consists of lobes of large round, oval, or spindle cells embedded in the corium and sharply delineated from the surrounding tissue, and also of long cords of similar cells lying between fibrous trabeculae. In some parts of the tumour hyaline degeneration of the fibrous tissue occurs, giving the appearance of the cylindroma. Serial sections shew, however, the development of the growth both from the surface epithelium and the walls of the hair follicles.

Removal is the only form of *treatment* offering any hope of cure as far as my knowledge goes.

**Sebaceous Adenoma.**—Adenomas of the sebaceous glands, both simple and malignant, have in rare instances been described as isolated tumours, and one or two have come under my observation (Fig. 129). More commonly, however, sebaceous adenoma is used to describe a distinct group of morbid growths which appear at any time from soon after birth to the age of puberty, and are usually associated with some mental defect on the part of the patient. Thus, though rare in general hospitals, these cases are comparatively frequent in the idiot asylums. Recent investigation has shewn that adenoma sebaceum is especially associated with tuberose sclerosis, in which tumours of the brain, heart, and kidneys are also found. Drs. Dickson and Fowler give a table of 29 cases of tuberose sclerosis, in which adenoma sebaceum was mentioned as present in 13 cases, absent in 3 cases, and not mentioned in 13. They suggest that the presence of adenoma sebaceum may be of use in leading to the correct diagnosis of tuberose sclerosis during life in cases of congenital weak-mindedness.

Three types of growth are usually associated in these cases, namely, the so-called "sebaceous adenoma," fibrous thickenings or patches, and common moles. The "sebaceous adenoma" is in reality a mixed growth consisting of vascular and sebaceous hypertrophy. In some cases the vascular element predominates, so that the case suggests a symmetrical angioma; in others the growth is almost purely sebaceous gland. In this latter variety the tumours form brownish and rather shining nodules, varying in size from that of a pin's head to that of half a hazel nut. The openings of the sebaceous glands are rather large, and consequently the surfaces of the tumours may be mammillated. They occur chiefly on the face, and especially in the "flush area," namely, the sides of the nose and cheeks, and the chin, the forehead being also affected to some extent. Microscopically, as has been mentioned, the tumours consist of sebaceous hypertrophy and vascular proliferation in varying proportions. The sebaceous tumour, though clinically fairly well circumscribed, is microscopically quite diffuse, so that its edge passes insensibly into that of the surrounding tissue. For this reason it has been contended that the tumour is not a true adenoma, but rather a local hypertrophy. The tumour is probably congenital in origin, but only takes on

active growth at the age of puberty when the sebaceous glands in general develop actively.

*Treatment.*—Large tumours should be excised and small ones destroyed with the actual cautery when the sebaceous element is marked; whereas those consisting mostly of vascular tufts may be obliterated with the electrolytic needle.

**Growths of the Sweat Apparatus.**—*Hidradenoma.*—These small tumours have the great peculiarity that they usually make their appearance in large numbers somewhat suddenly, hence the adjective often applied to them "eruptive." They occur as yellowish-pink swellings

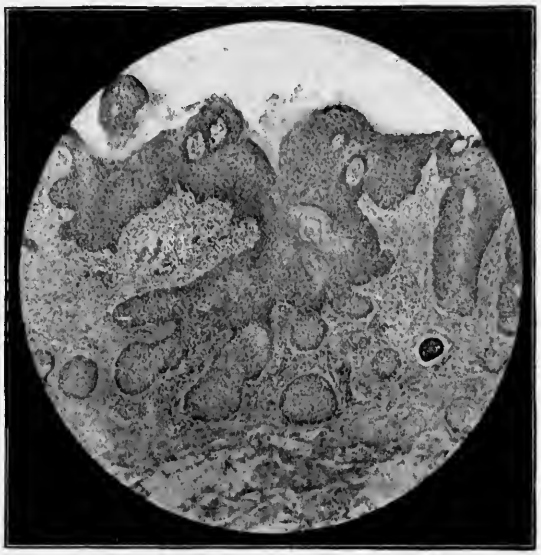

FIG. 129.—Photomicrograph of congenital adenoma sebaceum: solitary type. × 90.

varying in size from that of a pin's head to that of a pea, and are situated on the back and front of the trunk. They are widely scattered and not painful, and so may be fairly easily distinguished from myoma cutis; they do not often occur on the face, so that they should not be confused with Brooke's hair-follicle tumours. It is true that in certain cases, as already mentioned, tricho-epithelioma is seen on the face, and is found on microscopical examination to be associated with hidradenoma in the same tumour. In these cases, however, the tumours do not appear suddenly in crops, and are easily distinguishable from the eruptive form, which indeed they do not resemble clinically.

*Microscopically* they consist of scattered epithelial tubes here and there dilated to form ampullae in which is contained some hyaline substance. Their origin has been the subject of some discussion, and they have been considered of lymphatic origin (cf. Kaposi's name lymphan-

gioma tuberosum multiplex). The work of Darier, Jacquet, and Török has, however, almost conclusively proved that they are tumours of the sweat glands, and are probably due to congenital deposits which do not take on active growth until later.

Papilloma of the sweat duct has been described in one or two instances. It is very rare and occurs singly, forming a growth up to the size of a small nut. In Dr. Rolleston's case incomplete excision had been performed before he saw it and the tumour had recurred.

The *treatment* of hidradenoma is surgical only. The growths may apparently be shelled out in some cases, though from my specimens this does not seem possible. They have been destroyed by electrolysis; but probably, if any interference is necessary, excision is the best method. Papilloma of the sweat duct should be excised.

**Fibrous Tissue Tumours.**—*Fibroma.*—Scattered fibrous thickenings occur as part of the general skin deformity in the sebaceous adenoma of imbeciles. Single or multiple small fibromas are not uncommonly found scattered as small ivory-white swellings on the arms and shoulders, and are of no particular significance though rarely they grow to a considerable size. Large multiple fibromas occurring symmetrically and affecting more than one member of the same family have been observed, and such a family has come under my own observation. The so-called small pendulous fibromas are most frequently degenerated moles.

*Neurofibroma. Neurofibromatosis, von Recklinghausen's Disease.*—This disease is characterised by the association of three symptoms, namely, tumours on the palpable nerve-trunks, tumours in the skin, and pigmented patches. Often only two of the three symptoms are present. The tumours usually begin to develop about the age of puberty, though the foundation is probably congenital. They first appear as small pea-sized bodies which may be seated in the more superficial part of the skin, when they project as slightly yellowish growths, or they may lie in the depth of the corium when they have usually a pale bluish colour, and can be made to move through the skin into the subcutaneous tissue, leaving a hole in the corium. They are often painful and tender to the touch. When they grow large they may degenerate and hang as bags from the surface.

Microscopically they form well-defined growths consisting of long ovoid cells crossing each other in various directions, but here and there these cells are arranged in whorls which contain in their centre a fine nerve-fibril. These nerve-fibrils are histologically exactly similar to newly developing nerves, and it is possible that actual new formation takes place.

The pigmentary patches may be either freckles, large yellow stains (so-called "café au lait" patches), or hairy moles. Until lately no treatment was considered of any avail except perhaps ablation of those which gave rise to considerable inconvenience, but recently the injection of thiosinamine salicylate has been reported to cause a satisfactory shrinkage of the growths (*vide* also Vol. VII. p. 369).

**Elastic Tissue Tumours.**—*Elastorrhexis, Pseudo-xanthoma elasticum.*—

This very curious disease appears to fall into place most naturally among the tumours though it is doubtful if actual new growth takes place.

Clinically there appear in various parts of the skin small raised tumours of a yellowish or greyish colour, in some places arranged merely as groups of lentil-sized nodules, in others occurring as beaded streaks. They have been described on the anterior surface of the abdomen, especially around the umbilicus, the anterior wall of the axilla, the root and sides of the neck, in the flexures of the limbs, the under surface of the penis, and in one case in the mouth. In the cases described by Balzer, Chauffard and Darier, and Bodin, the patients were all males with advanced pulmonary tuberculosis. In the only case which I have had under my own care and from which my material comes, the patient was an elderly woman suffering from hemiplegia and aphasia. No clear history of the duration of the tumours could be obtained owing to the aphasia. In this case almost the whole of the front of the trunk was covered with these small tumours, especially the lower abdomen. They projected nearly an eighth of an inch, were ivory-yellow in colour, and quite soft to the touch. Their general distribution and appearance somewhat resembled old striae albicantes, but they were much more marked and definitely raised, and accurate observation shewed that the real striae albicantes lay between the lines of the growths and were unaffected by the process. The arms, legs, and neck were also to a certain extent affected. They did not give rise to any subjective symptoms, and were apparently stationary during the time that I had the case under observation. In a second case kindly shewn to me by Dr. J. J. Pringle the symptoms were identical, and the patient, an elderly woman, was unaware of the condition.

*Microscopically* the epidermis is normal and the fibrous tissue little if at all altered. In the depth of the corium, however, there are large collections of fragmented angular pieces of tissue giving the ordinary reaction of elastic tissue. In some cases also there have been found large giant cells apparently engaged in destroying the masses of elastic tissue, but in my case I did not find these present. The pathological condition thus suggests fragmentation of the elastic tissue which is afterwards attacked by the giant cells.

*Treatment* is not advisable, as the little nodules do not give rise to any discomfort.

**Leiomyomas.**—These are also rare tumours though much more common than the foregoing. They occur usually scattered over the chest in the form of ovoid, deeply-seated swellings, from the size of a pin's head to that of a haricot bean. They are commonly of a dark brownish-red colour, and are very firm to the touch. They are not infrequently spontaneously painful, and are generally very tender on pressure. In a case under my own care the tumours were situated on the forehead over a triangular area almost exactly corresponding to that of the external branch of the right supraorbital nerve. According to the history there had been a sudden outbreak of blisters resembling those of

herpes zoster, and when these had subsided a slow growth of tumours had occurred in the scar. There had never been any pain or tenderness in the affected part.

*Microscopically* the tumours consist of more or less circumscribed new growths made up of large bundles of non-striated muscular fibres running in all directions through the corium. It is difficult to trace their development, but they must grow from the musculi erectores pilorum.

Excision of the tumours if painful is the most satisfactory treatment.

**Angioma.**—These tumours form a somewhat ill-defined group, and are therefore rather difficult to classify. Apart from the cirsoid aneurysm which more properly belongs to the domain of surgery, we may distinguish

FIG. 130.—Photomicrograph of an angioma, shewing telangiectasis without endothelial proliferation. × 100.

(1) cavernous angioma, always congenital in origin, and varying considerably in the amount of actual new tissue-formation as compared with the enlargement of the vascular channel; (2) capillary angioma, a large group of vascular lesions varying greatly in their etiology.

(1) *Cavernous angiomas* may be broadly divided into classes. In the first class the tumour, though more or less tense, can be emptied by slow pressure, and gives the impression to the finger of a mere bag of fluid. Microscopically the tumours consist of large dilated vessels distended with blood, but shewing no marked growth of new tissue (Fig. 130). When treated by electrolysis they are easily destroyed, and the tendency to recur is very slight. The second class can also be emptied by pressure with the finger, but a distinct new growth can be felt in addition to the fluid. Microscopically, the individual vascular spaces are much smaller and more closely set, and the intervening tissue is largely composed of

proliferating endothelium which may often be seen extending into the normal tissue beyond the edge of the tumour (Fig. 131). These tumours are more common than those of the first class, and are much more resistant to treatment, since if any of the growth be left recurrence is sure to occur. It is not always easy to decide definitely on microscopical examination whether such tumours are innocent or malignant; but there is a certain amount of regularity about the arrangement of the walls of the vessels and a rather sharp limitation of the edge of the tumour, and, lastly, with care parts of the tumour can usually be found which shew

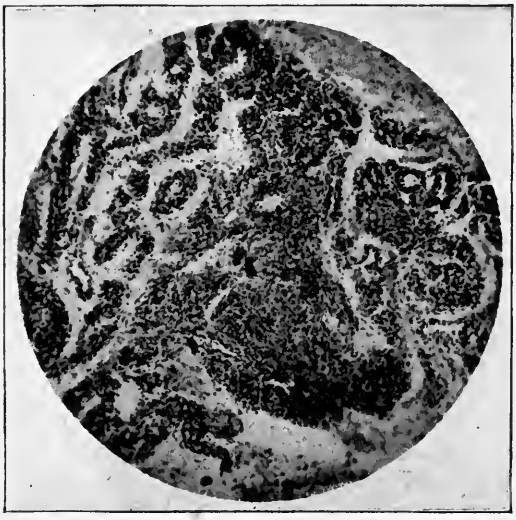

FIG. 131.—Photomicrograph of angioma with much endothelial proliferation. × 150.

normal sweat ducts passing uninjured through the tumour, a state of things which, as far as I am aware, does not obtain in sarcoma.

*Capillary angiomas* may be divided into three main classes, namely, the congenital, so-called port-wine stain, the small traumatic angiomas, and the idiopathic telangiectases.

The port-wine stain is often large and not uncommonly corresponds to some nerve area of the face; it is commonly single, but may be multiple, several patches being scattered over the body, or a single large patch being surrounded by a number of small satellite patches. The colour varies in different cases from a bright red to an almost black-blue, and even in the same case there is often considerable variation corresponding to changes in the temperature, excitement, and other factors. The naevus may be flat or slightly raised, and the surface may be either quite smooth or there may be small seed-like elevations upon it. The whole of the red colour may be dispelled by pressure, leaving a brownish-yellow stain behind. It should be remembered that capillary angiectasis

often forms part of the substance of ordinary pigmented moles, and may contribute the larger share of the tumour in sebaceous adenoma.

The simple traumatic angioma or "spider naevus" occurs especially in those whose skin is much exposed to the weather, and may be also set up by a blow or the bites of small insects. I have observed a minute spider naevus develop at the site of a mosquito puncture, and a patient of mine who lived on the river confirmed this observation repeatedly after his attention had been drawn to it. The spider form is especially common in patients suffering from hepatic cirrhosis (Bouchard, Osler).

Clinically these small angiomas shew as small red patches which are more less obviously made up of dilated vessels. Usually, but not always, the angioma is observed to refill after expression of the blood from a central point, which can be recognised as a small dark speck before the pressure has been applied.

Another form of multiple capillary naevus of frequent occurrence appears usually in later middle life as bright red, slightly raised, seed-like growths usually scattered about the chest and trunk. These are probably the tumours which are sometimes referred to as "De Morgan's spots," and have been stated to occur with especial frequency in patients who are the subject of malignant tumours.

This association of cutaneous angioma with cancer has been observed by many investigators, among others by Menetrier, who uses the name "Signe des Naevi de Trélat," and Mignon. An exhaustive investigation on the subject has, however, been made by Symmers, who could find no definite relationship between cutaneous angiomas and cancer, but believed that when present in large numbers in young people they were associated with arterio-capillary fibrosis and high arterial blood-pressure.

Lastly, there is a type which deserves especial mention, and is usually but not always a family disease. In this type the earliest feature is generally the recurrence of haemorrhage connected with some organ other than the skin, such as the nasal mucous membranes, pharynx, and less commonly into the retina. Dr. Parkes Weber has published a very full account of such a case in which both the mother of the patient and several of her children were affected. He comes to the conclusion that the disease affects and may be transmitted by both sexes; the haemorrhage is chiefly from the mucous membranes; it is not usually associated with haemophilia; it is usually "late developmental" and is noticed in middle life; the epistaxis, however, is an early symptom; the anaemia and bleeding become more severe in later life and a vicious circle is set up, the bleeding causing anaemia, and the anaemia disposing to further bleeding; the disease may be compared with the family tendency to piles and varix. Dr. Colcott Fox published a very complete report of a case of multiple telangiectasis in a young woman. In this case there seemed to be no ascertainable family tendency. Dr. Fox gives a very full bibliography of the allied conditions, mentions the statement that these cases are associated with arterio-capillary fibrosis and high blood-pressure, but does not find any very convincing evidence of it.

The *treatment* of cutaneous angioma should be varied according to the type present. Large cavernous angiomas may be either excised or treated by electrolysis. If the former method be used it will be found that there is no difficulty caused by haemorrhage provided that the line of the excision passes well outside the limits of the growth. If for any reason electrolysis be preferred the bi-polar method is probably the best. Several long needles, preferably of iridio-platinum, are passed into the growth from the edge towards the centre, and are connected with the positive pole which gives a firmer clot than the negative. A single needle is then attached to the negative pole, and this is moved about from place to place so as to destroy the more superficial part of the growth where actual involvement of the skin itself occurs, and a scar is consequently unavoidable. As regards the strength of current necessary one may use twenty to forty milliamperes with the positive needle, but it is better not to exceed five if the negative is to be left in any one position for a considerable time. By the method above detailed one may therefore use twenty milliamperes through both needles, since it is obvious that where both needles are used it is impossible to secure a different strength of current for each pole, and the objection to the use of strong currents with the negative pole may be obviated by moving this about on the surface of the tumour. The process should be continued until the whole of the tumour is converted into a solid mass, and if this conversion has not taken place by the time that the negative needle has been worked all over the superficial part of the growth the negative needle may be disconnected and a large indifferent electrode substituted. It is important in this case, especially if the naevus be situated upon the face, to place the negative electrode in close proximity to the positive needle so as to avoid as far as possible the diffusion of the current and the consequent dangers of shock.

The port-wine naevus was until recently the despair of the dermatologist as regards producing a satisfactory cosmetic result. I have in one case, it is true, succeeded in producing a very fair result by tattooing the whole of the part with a fine electric cautery at a dull-red heat, and thus stippling the red area with minute white scars. The process, however, was very tedious and painful, although preliminary cataphoresis of the part with cocaine was always undertaken. More recently radium has been greatly praised for its action in causing obliteration of dilated capillaries, but I have not had great success with it, and Wickham is not favourably impressed with its action in these cases. The treatment by means of either liquid air or carbonic-acid snow, however, is likely to prove much more satisfactory. In the treatment by these means the part is pressed upon by either a pad of cotton-wool soaked with the liquid air or a crayon made by packing carbonic-acid snow into a suitable receptacle, usually in the shape of a funnel, so as to form a solid pencil of the required size. Rather firm pressure is made upon the area to be treated and kept up for from five to fifteen seconds. On removal the tissue will be found to be frozen into a solid block which thaws in about

a minute. Nothing further is done, and in about half-an-hour there is a severe urticarial reaction followed in a day by the appearance of an inflammatory bulla. This dries up in about a week, and the skin returns to an almost perfectly normal appearance, the angioma being so completely destroyed that it is difficult to identify its site. It is quite common to find that certain portions of the angioma have escaped destruction as the freezing of the part extends a good deal beyond the application of the pencil or swab, and it is only that part of the tissue that has been in actual contact with the extremely cold body that is cauterised severely enough to cause obliteration of the vessels. The small areas that have escaped destruction can be treated by a repetition of the method, but it should be remembered that a slightly longer exposure will be necessary on subsequent occasions as the skin seems to acquire a certain degree of immunity from the first treatment. Great care should be taken therefore to make the application as accurate as possible on the first occasion, but at the same time it should be remembered that too long an exposure to the intense cold will be followed by extensive necrosis.

The older methods by the use of various caustics cause unsightly scarring, and have really no place in modern treatment.

**Lymphangioma Circumscriptum:** "*Lupus lymphaticus.*"—This is a rare form of growth congenital in origin, but often not developing to any considerable degree until about puberty.

It appears in all situations on the limbs and trunk; but I have not heard of a case on the face. The growth takes the form of deep vesicles collected into a patch with usually some outlying portions. The vesicles vary in size from that of a pin's head to that of a pea, the smaller ones resembling small pearly grains set in the skin whilst the larger have been likened to frog's spawn. The vesicles are mostly pale and are tensely filled with a clear fluid, but some of them generally have a reddish tinge from the presence within them of a vascular tuft projecting into the cavity. If a vesicle be pricked the serum rapidly exudes away for a few moments, and then the flow ceases almost entirely when the cavity becomes emptied. In some cases there is a good deal of warty thickening of the epidermis over the patch. From time to time the patches undergo a curious erysipelas-like inflammation, the cause of which it is not easy to determine.

*Microscopically* the growth consists of enormously dilated lymph-sinuses situated for the greater part in the papillary layer. These sinuses are lined with a single layer of endothelial cells, but here and there the lining cells proliferate into multinucleated endothelial buds which may break off and lie in the cavity as giant cells. The fibrous tissue separating the sinuses from the epidermis is often so thin as to be almost invisible, but careful examination always reveals the presence of a fibrous layer however delicate. There are often present also some dilated blood-vessels in the corium, and almost invariably insignificant collections of lymphoid cells, probably the result of the inflammatory attacks mentioned above.

The *treatment* of the condition should be by excision if the patch is small, or by destroying the individual sinuses if it is too large for excision. For this purpose a Paquelin's cautery is the best instrument to use, as the large amount of lymph in the sinuses cools down the small mass of metal in the galvano-cautery too quickly. It is almost always necessary to interfere with this form of tumour by some means, as the frequent inflammatory attacks are the source of much pain and discomfort.

**Osteoma.**—Several doubtful cases of osseous development and calcification of the skin and a few cases of enchondroma are on record. The recent case of Drs. Stopford Taylor and Mackenna appears to be perfectly convincing. The patient was a female child in whom at the age of five months a purple patch had been noticed above the left knee. When seen at fifteen months there were lesions on the left thigh, the right leg below the knee, the anterior and posterior aspects of the chest, the left forearm, and the left side of the scalp. The lesions were pearl-like tumours seated on a purple base, and on excision appeared to be plates of ossifying cartilage lying in the deeper part of the corium. The child died of pneumonia after measles, but no necropsy was obtained.

## Malignant Tumours

Carcinoma.—Carcinoma of the skin may be divided into two main groups, namely, primary tumours of the epithelial structures of the skin, and secondary, metastatic, invasions.

As the latter form needs a short description only it will be dealt with first. **Secondary carcinoma** of the skin is not common in internal carcinoma, but is most frequent in cases of primary carcinoma of the breast and of the prostate gland. In some cases of mammary carcinoma the primary growth may be small and of the "atrophic scirrhus" type, yet the invasion of the skin may be extremely extensive, so that almost the whole of the skin of the neck, chest, and abdomen is implicated. ("Cancer en cuirasse"). The clinical appearances of this form are usually a small puckered ulcer over the mammary region, and a bluish-red nodular infiltration of wide areas of the surrounding skin. The infiltrated skin around the primary growth seldom shews any ulceration, but is extremely hard and immovable on the deeper structures.

*Microscopically* the epidermis and the papillary body are normal, but between the fibrous trabeculae of the corium are numerous narrow branching bands of ovoid epithelial cells with here and there slight collections of lymphoid cells surrounding them, but the reactive inflammation is not usually marked. No treatment is of any avail, and the patient dies from exhaustion or respiratory complications due to the interference with the breathing produced by the stiffening of the chest wall.

In other breast cases and in prostatic carcinoma the secondary growths are often multiple and widely scattered. They occur both subcutaneously, producing hard pale tumours adherent to the skin, and, more commonly, in the substance of the corium itself, in which case the

tumours form dome-shaped or flattened, hard swellings, with a smooth shining surface and of a bluish-red colour. Microscopically they are found to consist of masses of epithelial cells with very little fibrous stroma, and they deviate so much from the primary growth that they afford no clue to its position. In such advanced cases of carcinomatosis there is obviously nothing to be done in the way of treatment.

In connexion with carcinoma of the breast I may mention an interesting case of primary carcinoma occurring in the axilla of a woman. By Mr. Lenthal Cheatle's kindness I have been able to study sections from the case. Clinically there was a small, pea-sized swelling in the axilla resembling the common cystic swellings of the sweat glands of this region, but as the little tumour was giving rise to some pain and there was a certain degree of dimpling of the skin it was removed and examined. Microscopically it was found to consist of large and somewhat cystic alveoli of mammary tissue in close proximity with, but easily distinguishable from, the large axillary sweat-gland coils. Beneath these cystic alveoli there was a considerable mass of ovoid epithelial cells which were infiltrating the deeper tissues, and were evidently connected with the ectopic breast tissue.

Sir F. Champneys and Mr. Bowlby have described the development of small tumours in the axillae of lying-in women, but did not apparently meet with any malignant cases. Further, they appear to regard the swelling as due to enlarged sweat glands which were taking on a mammary function, rather than to the occurrence of functional activity in ectopic portions of breast. Mr. Cheatle's case seems, therefore, to differ slightly from theirs as there is no doubt that in his case the tissue from which the carcinoma developed was true mammary gland.

The **primary carcinomas** of the skin may be divided into prickle-cell carcinoma (squamous-celled carcinoma), rodent ulcer (basal-cell carcinoma), Paget's disease of the nipple, and melanotic or naevo-carcinoma.

Of these the first variety may occur either on what was previously apparently healthy skin, or in skin which was already obviously abnormal. Such are the cases occurring in workers with paraffin or tar, those secondary to arsenical keratosis, those occurring with xerodermia pigmentosa, with the chronically irritated skin of sailors, with senile sebaceous warts (*Épithéliome sébacée* of the French writers), or scars due to burns (compare the kangri carcinoma of Thibet), *x*-ray dermatitis, etc., and on lupus vulgaris, and lupus erythematosus.

The squamous-celled carcinoma of tar workers, so-called "tar cancer," deserves special description on account of certain peculiarities. As has already been described under benign warts, the tar-worker is liable to develop ordinary flat warts and also follicular growths which first form small button-like infiltrations around groups of hair follicles and then develop into definite embedded tumours or "tar mollusca." Some of these latter may at any time take on malignant growth and ulcerate in the centre. If excised they shew the ordinary appearances of prickle-celled carcinoma, but with the distinction that the subjacent and sur-

rounding infiltration with plasma and lymphoid cells is extraordinarily dense. If left undisturbed, some of these tumours may shew all the characteristics of deep squamous-celled carcinoma with secondary implication of the lymphatic glands; but in other cases the whole tumour seems to become snared off by the infiltration and necroses and falls out, leaving a simple ulcer which heals soundly. I do not know of any criterion which will enable us to decide on the tumours which should be removed and on those which may be left; it is better, therefore, that all should be excised at once. With the superior hygiene introduced into the best tar-works all forms of tar dermatitis are rapidly disappearing, and this form of cancer is therefore happily becoming rare.

The squamous-celled carcinomas supervening upon other morbid conditions of the skin and those growing from apparently healthy skin are often divided into the superficial and the deep; but this classification is arbitrary, since many of those which are at first superficial change their characters later on and rapidly invade the deeper tissues.

The first clinical sign is nearly always the formation of a small, hard, and often pearly thickening in the skin, surmounted by a small scale. At first the scale may be picked off, leaving a moist shining surface beneath, but in time the detachment of the scale causes bleeding. The little button-like tumour enlarges at a variable rate, sometimes comparatively quickly, at others so slowly that the growth is believed to be stationary. It may then begin to project as a papillomatous growth above the surface, though always retaining the infiltrating character in the depth of the skin, or it may spread out parallel with the surface as a pale bluish-pink disc, or, again, it may spread also into the subcutaneous and deep tissues forming a more or less irregularly spherical tumour. In any of the three events ulceration may and usually does take place at some time or other, and the floor of the ulcer is of a dark-red colour, and has a velvety appearance caused by the presence of small epithelial prominences. The discharge from the ulcer is usually a thin mucoid fluid mixed with a little blood. The lymphatic glands are not usually affected early except in the case of the type that rapidly extends deeply. Indeed it would appear that it is only when the carcinoma begins to infiltrate the tissues deeply that lymphatic infection occurs, and this falls into line with Mr. Handley's contention that so-called lymphatic metastases are in reality mere extensions.

The situations most frequently affected are the face, especially at the junction of the mucous membrane of the lips with the skin, the auditory meatus, the genitals, and the backs of the hands. Other parts of the body appear to be about equally affected. The male sex, probably from greater exposure to adverse influences, is more commonly affected than the female.

The diagnosis of squamous-celled carcinoma may occasionally offer difficulty, but is usually fairly easy, except from the non-ulcerative stage of rodent ulcer, when it is of no great importance. From tuberculosis verrucosa cutis the following are the chief points of distinction. Although

the actual wartiness is hard in both cases, the base in tuberculosis is a soft cushion, whereas that of epithelioma is, as already stated, almost stony hard; if squeezed, tuberculosis yields, as a rule, small scattered beads of ordinary pus, whereas the carcinoma is more likely to yield blood. Cutaneous gummas are grouped, and occur as small nodules which necrose and heal; they have a less well-defined edge, commonly liquefy in the centre, and grow much more rapidly than carcinoma. The differentiation from certain forms of chronic infective ulceration with verrucosity may be difficult, but the distinguishing point is the presence or absence of the hard infiltration of the skin beneath.

The *prognosis* varies greatly in prickle-celled carcinoma. In cases of xerodermia pigmentosa, and in the so-called *épithéliome sébacée*, and especially in squamous-celled carcinoma complicating lupus vulgaris, it is essentially bad, in the first two cases because the predisposing condition is so widespread and persistent; in the third case because the type of carcinoma itself seems to be of great malignancy. Until the lymphatic glands are affected, or unless the mere extent of the growth renders complete removal impossible, the prognosis of squamous-celled carcinoma on previously healthy skin may be considered good.

The *treatment* of squamous-celled carcinoma, where possible, should invariably be complete removal, and no time should be wasted with caustics or other methods. In undoubtedly inoperable cases, however, the *x*-rays, or radium, or any of the chemical methods, may be given a trial, but it must be distinctly understood that neither the *x*-rays nor radium has anything like the beneficial action which is seen in rodent ulcer.

**Rodent ulcer** is a fairly common form of malignant growth of the skin, probably much more so than is generally believed. It occurs most frequently on the face, and the sites of predilection are the inner angle of the eye and the naso-labial fold. It is, however, also seen on the body, though much less commonly, and multiple rodent ulcer is by no means a great rarity. Mr. G. L. Cheatle has pointed out that the sites of incidence of rodent ulcers are commonly connected with Head's segmental areas (*vide* Vol. VII. p. 484).

The earliest appearance is somewhat similar to that of squamous-celled carcinoma, that is a slight thickening of the skin often surmounted by an adherent scale. If no scale is present, a small ivory-yellow prominence is seen as the tumour grows, and close examination reveals small dilated vessels coursing over it. To the touch the tumour is extremely hard, and it can be felt to lie in the skin itself. In this stage the growth may remain for years, and there is little doubt that many people carry such without any other symptoms to the end of their lives. In most cases, however, the tumour very gradually enlarges, taking years to attain any size, and then begins, often after some insignificant trauma, to ulcerate. The ulceration is, as a rule, superficial at first, and is covered with a scab which becomes detached from time to time with slight haemorrhage. The floor of the ulcer is bright-red and velvety or glazed in

appearance. The ulcer may heal over in some parts and extend in others, but the healing is never sound, and usually breaks down again from time to time, so that patches of ulceration alternate with white areas of newly grown keratinised epithelium. After a time the ulceration begins to spread deeply and then invades almost every tissue, including bone, though the sclerotic coat of the eye appears to be extremely resistant. Invasion of the lymphatic glands does not occur. Finally, if left unchecked, the growth and ulceration may cause the most horrible mutilation, perforating the bones of the skull, producing blindness by invasion of the orbit, destroying the whole of the front of the nose, and causing death by suppurative complications.

The *histology* of prickle-celled carcinoma or squamous-celled epithelioma and that of rodent ulcer will be dealt with together for the sake of comparison. In both diseases the essential part of the malignant tumour is the down-growth of the epidermis into and through the corium.

In squamous-celled carcinoma this down-growth can be usually easily traced to its continuity with the surface epidermis, but in rodent ulcer this connexion is more difficult to establish, and it is considered by many to be a tumour derived from the lining (outer root-sheath) of the hair follicle. In squamous-celled carcinoma in its earliest stages only a certain lengthening and widening of the interpapillary processes is to be observed, and in this period it is probably not possible to make the histological diagnosis. Hansemann, in his monograph on malignant tumours, figures such a slight enlargement associated with insignificant chronic inflammation, and mentions that after removal recurrence and lymphatic infection occurred. A slightly more advanced stage shews obvious down-growth and branching of the epithelial processes, beneath which is a marked mononuclear (lymphoid and plasma-celled) reaction which is associated with disappearance of the elastic fibres (Fig. 132). Owing to the branching of the processes pieces become cut off from the main mass in preparing the vertical section, and appear as islands of epithelium, but it must be remembered that serial sections will shew all these apparent islands to be connected with the main growth. The more or less irregular network of epithelium intermingled with connective tissue seen on cutting oblique sections of hypertrophic epidermis must not be confounded with this. A good rule, though, of course, not to be relied upon slavishly, is that where islands of fibrous tissue appear in a network of epithelium the condition is probably one of hypertrophied epidermis, and that when islands of epithelium appear in a network of fibrous tissue the case is probably one of malignant new growth.

These down-growths in squamous-celled carcinoma represent more or less the complete epidermis with the exception of the granular layer, though in a confused manner. Thus, the cells at the edge of the down-growth are usually more or less regularly cubical, with large nuclei and a moderately basophilic protoplasm. Within this is a mass of variable size made up of larger polygonal cells with more abundant pale-staining protoplasm separated from each other by well-defined intercellular canals

bridged over by prickles. In the centre more or less complete cornification may occur, forming a whorl of flattened cells, the so-called cell-nest. In parts the epithelium may degenerate so as to form cavities filled with liquid, in which are suspended round cells with one or many nuclei. In a good many places the cells may have lost their fibrillation and prickles, but in most squamous-celled carcinomas a little care will shew well-defined prickles in places. Mitoses, often of irregular character, occur in all parts of the tumour which are neither cornified nor too much degenerated. At the edge of the growth the epidermis is often simply hypertrophied. The corium below the growth and between the branches of the epithelium

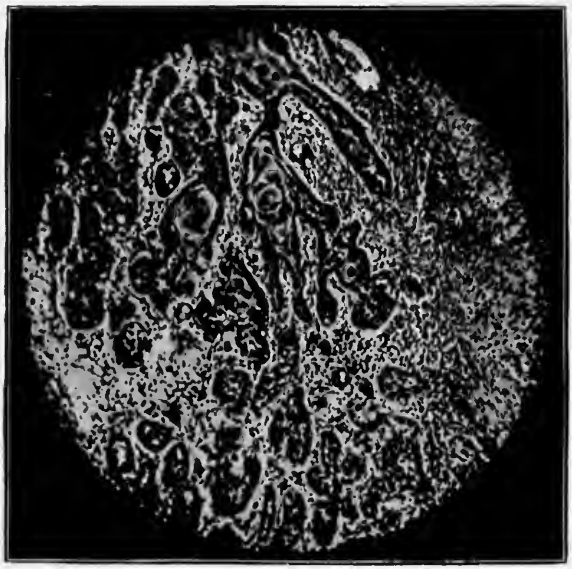

FIG. 132.—Photomicrograph of squamous-celled carcinoma, shewing cell-nests. × 300.

is oedematous, deprived of its elastic tissue, and infiltrated to a greater or less degree with plasma and lymphoid cells. These atrophic and oedematous changes are especially well marked in *x*-ray carcinoma (Fig. 133). Mast cells are generally somewhat numerous, and they, as well as lymphocytes and polymorphonuclear cells, may often wander in among the epithelial cells.

In rodent ulcer the distribution of the down-growth is not radically different, but there is usually a tendency to spread rather more laterally and less deeply (Fig. 134). The essential difference lies in the character of the cells forming the in-growth. The outermost layer of these cells is usually of a rather tall "palisade" order, whereas the cells forming the rest of the process are more or less oval in character, lying so close to one another that the cell margin is difficult to distinguish, shewing no

evidence of prickles or protoplasmic fibrillation, but containing a deeply-staining nucleus much larger in proportion to the cell protoplasm than is

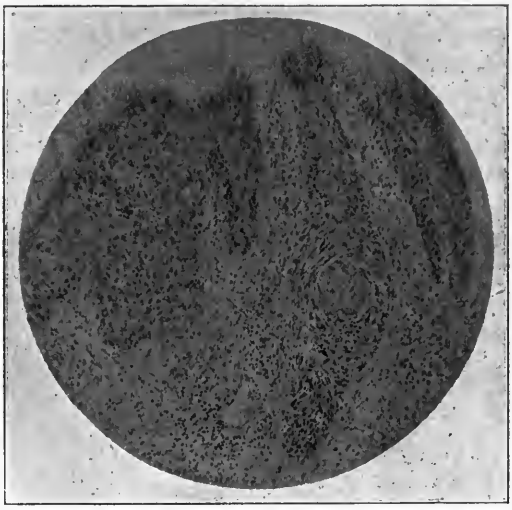

FIG. 133.—Photomicrograph of *x*-ray carcinoma. × 300.

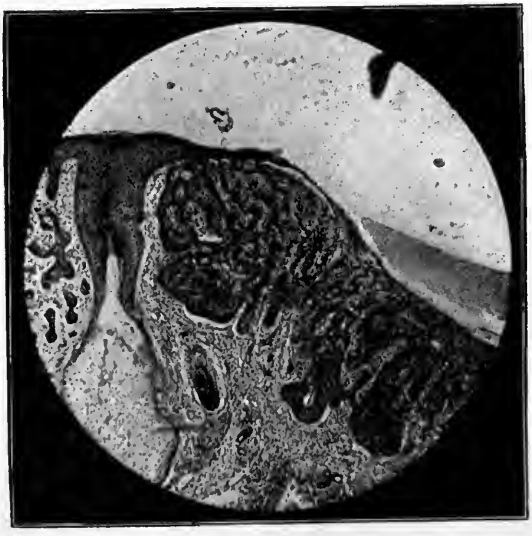

FIG. 134.—Photomicrograph of rodent ulcer. × 90.

the case in squamous-celled carcinoma. True cornification does not, I think, ever occur, but small hyaline pearls are sometimes seen. Cystic degeneration, with the formation of small cavities in the epithelial

masses, is not uncommon, and more rarely these cavities may attain a large size, so that most of an epithelial lobe comes to be occupied by such a cyst. Occasionally a patient gives a history that the tumour "burst and discharged water"; this is probably due to such cystic formation. In rare instances growths have been found which, under the microscope, shew a mixed formation of squamous-celled carcinoma and rodent ulcer. Through the kindness of Dr. MacCormac I have had the opportunity of studying two such specimens. In both of these the dividing line between the two forms was quite sharp, and the transition from the one form to the other occurred quite suddenly, giving the impression of two varieties of malignant growth in close contiguity rather than of a true mixture. The disappearance of the elastic tissue does not take place quite so far in advance as in squamous-celled carcinoma, and the plasmomatous infiltration is usually less marked. In both cases the floor of the ulcer, when present, is usually formed of irregular malignant epithelium, the corium not being laid bare.

Borrel has recently studied a number of extremely early carcinomas of the skin by cutting serial sections parallel with the surface. He finds that by means of an appropriate magenta staining he is able to demonstrate large numbers of the *Acarus folliculorum* in every case. He further points out that the carcinomatous change seems to begin in close connexion with the pilo-sebaceous follicle, and although he does not positively attribute the cancer to the irritation of the acarus he evidently considers this of importance. No very distinct classification was made of the growths examined, and it is therefore difficult to separate the rodent ulcers from the prickle-celled growths.

*Diagnosis.*—As squamous-celled carcinoma has been considered on p. 592, it only remains to deal with rodent ulcer. In the initial ivory-patch stage the chief difficulty lies in the diagnosis from sclerodermia. In a very superficial case under my observation I was quite unable to decide definitely without a histological examination. The presence of scales, the removal of which causes bleeding, is in favour of rodent ulcer, but I am unacquainted with any trustworthy criterion at this stage apart from microscopical examination. Later on the disease is often confounded with lupus or syphilis. From the former the diagnosis is not really difficult. The superior hardness of the edge in rodent ulcer, the absence of "apple-jelly" transparency, the greater tendency to haemorrhage, and the more advanced age at which it begins, being together sufficient. In syphilis it is only the late cutaneous gumma that can give rise to difficulty; the points in favour of gumma are the comparatively short history, the formation of a spherical nodule which softens, bursts, scabs and heals; the production of a soft, sound, pigmented scar; and the peculiar marginate spread. Lastly, by gentle pressure it is usually possible to obtain a mass of epithelial cells from rodent ulcer sufficient to make the microscopical diagnosis.

*Treatment.*—Very small rodent ulcers which can be easily removed without disfigurement are probably best excised. Care should be taken

to allow sufficient margin of healthy skin on each side and also below, and it is particularly important in making the incisions to slope them under the healthy skin rather than towards the growth. With due care, I believe, excision should be a certain cure in small rodent ulcers.

If excision is for any reason not practised, the physical methods by means of the *x*-rays or radium and the cataphoretic treatment with metallic salts must be considered. Of these probably the most certain in the case of small tumours is radium; indeed, the size of the growth that can be treated is only limited by the amount of radium available. The radium should be applied close to the affected part and left in position for from half an hour upwards, or according to the activity of the specimen. The treatment can be repeated from time to time until the growth has disappeared and any ulceration is soundly healed.

The advantage of *x*-rays over radium is that a surface of practically any size can be covered at one time. In most cases the results are equal to those obtained with radium, but more failures have been reported. They may be used either in a full dose as measured by the Sabouraud pastille repeated once a month, or by frequent small doses. In my experience the latter has seemed to give more evenly good results. Cataphoresis with sulphate of zinc is the most recent introduction, and has the advantage that the apparatus required is less costly than that for the preceding methods, and is within the reach of every one. All that is needed is a galvanic battery capable of giving a current of ten milliamperes through the body (that is, about eighteen Leclanché cells) a few zinc electrodes, leads, and some 2 per cent solution of zinc sulphate. Pieces of lint, absorbent wool, or blotting-paper are saturated with the solution and placed in contact with the growth or ulcer. The zinc electrode is then connected with the positive pole, the patient's hand dipped into a bowl of saline solution, in which the negative lead is also placed, and the current is gradually raised to a strength of ten milliamperes or as much as the patient can bear short of this. The current is passed for ten minutes, at the end of which time the ulcer is completely blanched, or a growth without ulceration is slightly whitened with an urticarial reaction around it. In a few days a heavy crust forms, and when this falls off the ulcer is often found to be soundly healed; if not, the process is repeated. My experience is that ulcerated growths are rapidly and soundly healed by this means, but I have seen one case and heard of others in which the treatment failed—in one actually appearing to do harm. It may safely be said that the treatment is not so certain as that with *x*-rays or radium; moreover, it is accompanied by considerable pain. Recent experience seems to indicate that relapse is frequent after ionic treatment.

Rodent ulcer has also been successfully treated by means of the actual cautery or chemical corrosives, but as, in my opinion, these methods are dangerous and uncertain, no further reference will be made to them.

**Paget's disease of the nipple,** or better, since it occurs elsewhere, *Paget's disease of the skin.* This comparatively rare disease is found most

often, as its name implies, in the skin of the nipple and areola, but it has also been observed in a few cases in the skin of the axilla, the umbilicus, the flank, the pubic region of the male, the vulva, and the anus. It begins as a red patch which rapidly develops an adherent scale. From the first there is a slight infiltration of the affected area giving a card-like stiffening to the part. Usually mistaken for a chronic form of eczema, it resists all ordinary forms of treatment, and spreads very gradually so as to form a more or less circular patch covered with scales and crusts. The nipple, in the case of the affection of the areola, soon flattens down and disappears entirely, thus providing an important diagnostic sign. Slowly the area becomes denuded of its horny layer and assumes a bright-red velvety appearance, with crusts in some places and small islands of white blotting-paper-like epithelium scattered over the affected part (epidermisation of Darier). The edge is quite sharply defined, and the whole patch is now definitely indurated and thickened, giving to the finger the sensation of "a penny felt through a cloth." After a very variable period the obvious malignant tumours appear. As regards the form and starting-point of the carcinoma which develops in association with Paget's disease there seems to be a difference of opinion, which is probably an indication that the carcinoma is not derived from the same part in every case. Most authors describe the malignant tumour as belonging to the type known as duct cancer, and in every case which has come into my hands this has been the form of malignant disease present. In older parts of the tumour the type is not so clear, as one of the characteristics of carcinoma associated with Paget's disease is its tendency to rapid metaplasia and deviation from the original type. Some authors of experience have, however, definitely described spheroidal-celled carcinoma of the breast as the type found in their observations. The tumours formed in connexion with Paget's disease of the skin other than the nipple have been described as spheroidal-celled and as squamous-celled carcinoma. The period which may elapse before the development of the tumours has been observed to be as long as twenty years, and until some tumour formation begins extension into the lymphatic glands does not occur. The subjective sensations are pricking, burning, and occasional stabbing pain in the part. The disease is unilateral in its development, and I am not aware of any cases in which both breasts have been affected. If, even in the early stages, a piece of the scale be peeled off and examined in potash solution under the microscope, there will be found embedded in it numerous double-contoured, more or less circular bodies which were at first mistaken for psorosperms, and this forms an important aid to the diagnosis of doubtful cases.

*Histology.*—Vertical sections through the whole skin from a case of Paget's disease shew the following microscopical appearances: The horny layer is lost in places, and the mucous layer is laid bare. Within the prickle-cell layer there are more or less numerous spaces caused by the separation of the cells which have lost their prickles and fibrillation (Fig. 135). These spaces, which extend even into the horny layer where

this is still present, are seen to contain curious bodies with a double contour and one or more nuclei (Fig. 136). Occasionally the double-contoured border contains a flattened crescentic nucleus, so that the appearance is presented of a nucleated mass of protoplasm lying within a nucleated capsule. These cells were for some time the subject of much dispute, being regarded by some as parasitic bodies of the psorosperm order. It is now generally admitted that they are a peculiar and characteristic form of cell-degeneration. In addition to this loss of prickles,

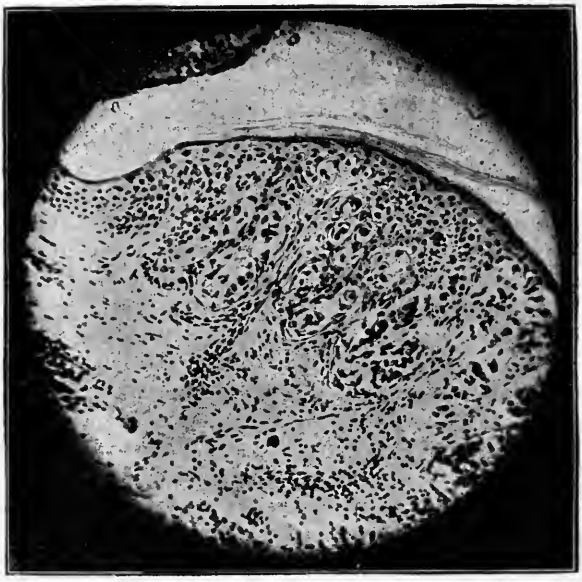

FIG. 135.—Photomicrograph of skin in Paget's disease, shewing the loosening and down-growth of epithelium. × 300. Compare with Fig. 127, shewing genesis of a mole.

formation of spaces, and peculiar degeneration, cases which are at all advanced shew down-growths into the corium of epithelial cells, most of which have also lost their prickles. The mammary ducts present malignant proliferation extending deeply into the breast, and when the tumour formation has begun to be clinically obvious, a carcinomatous tumour resembling "duct cancer" is also present. In one case of Mr. Cheatle's, in which there was a comparatively small and insignificant area of Paget's disease, and clinically no apparent tumour, the whole breast was excised and cut into whole vertical sections. The microscope revealed this malignant proliferation of the ducts extending to the deepest parts of the breast, even in those lying close to the pectoral muscle. This observation has a very definite bearing in deciding on the best form of treatment. In the corium the chief change is an enormous plate-like infiltration of lymphoid cells and plasma cells with partial disappearance of the fibrous

and elastic tissues. Careful examination shews that these cells appear first around the walls of the vessels, but they accumulate in such quantity that they form a continuous sheath beneath the epithelium. There is also a considerable number of new vessels formed in the corium beneath the diseased epithelium; these have only very thin walls, so that in some cases the plasma cells are divided from the lumen by only a single layer of endothelium.

Authorities still differ as to the nature of Paget's disease, but all competent observers agree that it is not a simple eczema. Unna believes it to be a special form of disease neither carcinoma nor simple inflammation; Darier does not offer a decided opinion, but apparently inclines to the view that, if not carcinoma, it is closely allied to it;

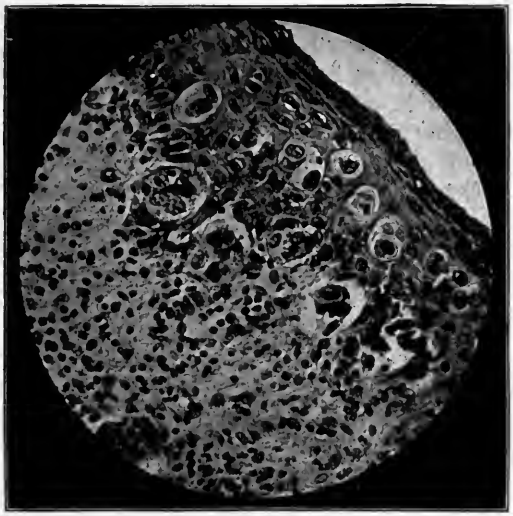

FIG. 136.—Photomicrograph of section of skin in Paget's disease, shewing the bodies mistaken for psoroasperms, in reality cell-inclusions. × 850.

my own view is that the change is definitely carcinomatous from the start, and is closely allied to that seen in the malignant tumours derived from moles (p. 602).

The *diagnosis* of Paget's disease is only difficult in the early stages, and even then careful examination should be sufficient to secure a correct view. As unilateral eczema of the nipple is of the greatest rarity, all unilateral epidermic disturbances of the nipple and areola should be regarded with grave suspicion. Closer observation will reveal the superficial infiltration, the well-defined margin, and the absence of deep-seated nodules which might give rise to confusion with syphilis. A microscopical examination of a scale will then reveal the curious bodies which are so characteristic of Paget's disease.

*Treatment.*—The treatment usually recommended is the excision

of the patch, taking plenty of margin in both depth and width. Some even recommend treatment with radium, *x*-rays, or caustics as sufficient. In the light of Mr. Cheatle's case, in which carcinomatous changes were found in ducts at the deepest part of the breast, although clinically there was merely a small patch of Paget's disease of about the size of a shilling, I can only advise the complete operation for removal of the breast as soon as the diagnosis of Paget's disease is established.

**Melanotic Carcinoma, Naevo-carcinoma.**—This disease is a secondary malignant change of pigmented moles, and as moles are still commonly described as of connective-tissue origin the malignant transformation is usually called melanotic sarcoma. The researches of almost all recent workers, however, point to the conclusion that both moles and their malignant tumours are epithelial in origin, and this opinion I hold strongly.

The earliest changes are usually a slight increase in the size of the mole, and a deepening and extension of the dark colour, but the latter is very variable. Before long there develops either a small ulcerating tumour surrounded by a polycyclical area of pigmentation, or a large mushroom-shaped growth without ulceration. The base of the tumour rapidly becomes infiltrated by the extension of the growth downwards, and the surface, from its great prominence, becomes liable to trauma and consequent ulceration later on. In the first form, in which its tumour formation is comparatively limited and ulceration occurs early, the growth is not of a high degree of malignancy, but unfortunately this is the less common type. In the second form, in which the tumour involves the whole of the pigmented area, glandular extension and other metastases occur with the most extraordinary rapidity. So much is this the case that it has been seriously contended that excision of the primary growth is unwise, for the reason that it tends to hasten the generalisation of the disease. In the melanotic carcinoma which has been described in the foot there seems to be a special tendency for the production of secondary growths in the skin of the leg. I am not clear as to the position of this type of carcinoma, as its origin does not seem to have been worked out completely.

The *histology* of this tumour is very similar to that already described under the heading of moles, with the additions that there is a considerable lymphoid infiltration often mixed up with the tumour, and that the fibrous tissue between the masses of cells disappears to a great extent. It is upon this latter sign that chief reliance should be placed in making the diagnosis of malignant disease, since any mole which is continually irritated will shew the lymphoid infiltration.

In the less malignant type, in which the pigmentation spreads in advance of the tumour, this pigmented epidermis shews, on bleaching, that the process which originally gave rise to the mole has recommenced. The cells of the deeper layers of the epidermis are swollen, vacuolated, and have lost their fibrillar structure and prickles, but have not yet begun to invade the deeper tissues. In fact the process is extremely

similar to that of Paget's disease, but the peculiar bodies are not found. It is for this, among other reasons, that I hold the opinion that Paget's disease is a carcinoma from the first.

The *diagnosis* of such a tumour can only lie between an innocent mole and a naevo-carcinoma, and it is unimportant since, if there is the slightest doubt, immediate removal should be practised. The treatment is of course surgical ablation, often involving very extensive operation, and the prognosis in the rapidly growing cases is almost invariably hopeless.

SARCOMA. — Besides the secondary growths that may occur in the skin as metastases from primary growths of the internal organs, especially the testicle, certain forms occur primarily in the skin itself. Unfortunately these are not very well defined, owing to the great difficulty which exists in separating sarcoma from chronic inflammatory troubles and from diseases such as mycosis fungoides and lymphodermia perniciosa.

Occasionally primary solitary sarcoma may occur in the skin and is usually of the round-celled type, forming a smooth pink or pale tumour more or less spherical in shape and elastic in consistency. The cases vary immensely in malignancy, and are sometimes, especially in children, intensely malignant. As an instance of a mild form I can quote the case of a middle-aged woman who came to me with a red growth of about the size of a dried pea, situated just between the posterior nail-fold and the interphalangeal joint of the left thumb. The tumour had been present for four months and was slowly enlarging; it was cut out and proved on microscopical examination to be an angio-sarcoma. There was no enlargement of glands, and there was no recurrence either locally or remotely after excision.

There are also two main types of generalised tumour which are usually included among the sarcomas, though it is very doubtful if one of them is in reality sarcomatous in nature.

1. **Type Perrin.**—Simple, hypodermic, round-celled sarcoma, non-pigmented, and asymmetrical. This begins with a single tumour which is white, red, or violaceous in colour. It occurs at all ages and in both sexes, and it rapidly generalises in the skin. There is no stationary period, but the tumours are always growing steadily from the start. Death occurs in from twelve to fifteen months, and the tumour microscopically consists of round cells with a few spindle-cells.

Probably it is this type that is occasionally arrested by the administration of arsenic or the use of the *x*-rays.

2. **Type Kaposi.**—Multiple idiopathic haemorrhagic sarcoma. This disease appears to be especially frequent in Italy, but cases have been seen in this country and are shewn from time to time at societies.

The disease affects males almost exclusively, and usually begins in the lower extremities more or less symmetrically. The earliest sign is the appearance of flat infiltrations and blue marks on the skin. This stage may last for years, after which it is followed by the second stage, characterised by the appearance of small telangiectases, angiomatous tumours,

and brownish-red nodes. The tumours are intensely cyanotic, so that they appear almost black. They grow very slowly, and again may last for years without serious deterioration of health. After this period marked oedema occurs and the tumours may appear all over the body (de Amicis saw one on the nose). Finally the third stage develops, and the tumours undergo necrosis and ulceration causing cachexia and death from exhaustion.

*Microscopically* they are said to be angiomatous from the beginning, and the pigment in them is broken-down blood. They take their origin in the pars reticularis, chiefly around the appendages, no doubt because of the vascularity of these. I had the opportunity of examining sections from Dr. Sequeira's case, and should have been very loath to make the diagnosis of sarcoma, the histological characters rather suggesting chronic inflammatory infiltration.

The *prognosis* in this type of disease is grave, but not necessarily fatal. A fair number of cases have recovered, and many have lasted without very intense discomfort for many years. As a rule, however, the disease is said to prove fatal within five years.

*Treatment.*—According to Kaposi no treatment is of any value, and arsenic both by the mouth and by injection seems to have proved unavailing in most cases, but there are a few reports of improvement after arsenical injection. In one reported case *x*-rays were used with some benefit, and, as no other treatment seems to be of any use, it is advisable to try this method of treatment.

**Endothelioma.**—This appears to be a very rare tumour of the skin. It has already been mentioned that many observers still describe the multiple tumours of the scalp under this name, but since the work of Dubreuilh I think these are better classed as benign carcinomas. I have examined one case of undoubted endothelioma of the skin, and I have no doubt that the existence of these tumours was overlooked in earlier days. This tumour came from the finger of a man, and was clinically a rather slowly-growing, elastic, bluish swelling. It was removed as benign and recurred some years later. Histologically it shewed very large lymphatic spaces lined with endothelium, and also columns of endothelial cells running from these linings into the surrounding fibrous tissue, thus giving a peculiar lace-like appearance.

Although the infiltration of the skin in *lymphadenoma* and *leukaemia* is not usually classified as a true tumour, a short note of the condition may be useful.

In **lymphadenoma** infiltration of the skin is not so very uncommon, and I have material from two cases. The affection in the skin appears late in the disease, and gives rise to the slow formation of cutaneous nodes. These are situated in the skin itself, and flatten out the epidermis over them, producing a tense, purplish-red, more or less discoid infiltration. Sometimes two or three nodes are grouped in close proximity, in others they form a more or less polycyclical, figurate sheet. The tumours are firm to the touch, and no yellow transparency can be

observed on pressing out the blood. On the whole, it may be said that, whereas they may be easily distinguished from lupus and syphilis, it would be impossible to differentiate them from superficial metastases of a sarcoma without the accompanying general clinical picture of lymphadenoma. They do not give rise to any particular trouble.

*Microscopical* examination shews patches of lymphoid and plasma-cell infiltration in the middle of the corium, having a strong resemblance to an ordinary lymph follicle in a lymphatic gland. Other eruptions occurring with lymphadenoma, such as the so-called "pseudo-leukaemic prurigo," are described elsewhere (p. 271, Fig. 63).

Growths in the skin in true **leukaemia** appear to be much less common. Nékám, in 1899, collected four cases of what he considered undoubted cases of leukaemic infiltration. Clinically the description corresponded closely with that which I have already given of lymphadenomatous infiltration of the skin.

*Microscopically* the distribution of the early infiltration was quite diffuse, the papillary layer and the interfascicular spaces of the corium being infiltrated with lymphoid cells. Nékám particularly states that plasma cells were absent, and also that the tumours were due to the accumulation of cells which were deposited in the part and not by the local growth of cells. The fibrous tissue between the cells is gradually rarefied so as to produce the reticular structure of adenoid tissue. The specimens derived from the case reported by Drs. Rolleston and Wilfrid Fox agreed closely with this description of Nékám, but the clinical appearances differed somewhat from those previously described. The skin eruption appeared first in the form of small, almost black intradermic nodules situated chiefly on the lower abdomen. These rapidly increased in size to that of a raisin and spread all over the front of the body. They were shiny on the surface and hard to the touch, some were a little tender on palpation, but otherwise they did not cause any subjective symptoms.

A. WHITFIELD.

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A. W.

# XANTHOMA

By Sir Malcolm Morris, K.C.V.O.

Xanthoma (W. F. Smith), or xanthelasma (E. Wilson), is a rare affection, first described by Addison and Gull under the name of vitiligoïdea, and characterised by the formation of plates or nodosities or larger growths of a yellow or yellowish-white colour embedded in the corium. When the lesions are in the form of plates the disease is distinguished as xanthoma planum, when in the form of nodules as xanthoma tuberosum, when in the form of larger growths as xanthome en tumeurs (Besnier), when associated with glycosuria as xanthoma diabeticorum. In respect of distribution, it presents two main forms. In one the lesions are limited to the eyelids (xanthoma palpebrarum), in the other they are scattered about, not over the cutaneous surface only, but also on the mucous and serous membranes (xanthoma multiplex).

**Etiology.**—There is no evidence of an infectious origin of xanthoma. Little is known of its causation except that it is often associated with glycosuria and with liver disorder, including the familial cholaemia of Gilbert and Lereboullet. Dr. Galloway suggests that most of the cases of xanthoma multiplex are accompanied by morbid changes of metabolism, especially associated with inadequacy of the functions of the liver. Persons in whom any habitual indisposition, particularly headache, is accompanied by darkening of the eyelids appear to have a predisposition to xanthoma. Though sometimes hereditary—cases in which the disease has appeared in two or even three successive generations have been recorded—it may skip a generation.

**Morbid Anatomy and Pathology.** — In the interpretation of the histological appearances there is wide diversity. The pathological process consists in the accumulation in the corium of large, often multinuclear cells of connective-tissue type, filled with a fatty material. There is, further, a formation of new and a destruction of pre-existing fibrous tissue. The epidermis is either normal or simply pigmented. The generally accepted view is that the process is more or less inflammatory, and that the xanthoma cells are derived partly from leucocytes, partly from connective-tissue cells. Krzysztalowicz especially insists on the hypertrophied connective-tissue cells with which the collagen and the fat lying in and between them build up the papule, and maintains that the so-called xanthoma cells are merely the greatly enlarged ordinary connective-tissue cells filled with fat. Pollitzer, from a study of 13 cases, concluded that xanthoma palpebrarum differs essentially in structure from the multiplex variety. According to him, the former is not a new growth, but a degeneration of pre-existing embryonically misplaced muscle-tissue, the so-called xanthoma cell being a fragmented

muscle-fibre in a state of granulo-fatty degeneration, with a proliferation of the muscle-cell nuclei. Xanthoma multiplex, on the other hand, he held to be an irritative hyperplastic growth of connective tissue, the cells of which produce fibrous tissue or undergo degeneration. Pick believed that the xanthomatous elements are not inflammatory products infiltrated with fat or undergoing fatty change, but are formed of material the significance of which is not understood. James C. Johnston regards the nodules of xanthoma multiplex as neoplastic and not inflammatory, as in xanthoma diabeticorum. That the latter form of the affection is of an inflammatory nature my own observations, made in conjunction with G. C. Henderson and Jackson Clarke, leave me in no doubt. It should be added that in rare instances xanthomatous plates are met with in mucous membranes, in the peritoneum, and in the walls of the bile-ducts and arteries. Malassez reports having discovered them on an ovarian cyst. Dr. Cranston Low reports a case in which there were lesions on the tendon sheaths, in the heart, and possibly in the liver; and Lehzen and Knauss had a similar case.

**Signs and Symptoms.** — In *xanthoma palpebrarum* the lesions begin, as a rule, in the upper eyelid, near the inner canthus; the growth spreads, and, becoming fused with others starting from neighbouring centres, forms an irregular plate, which has the appearance of a piece of wash-leather let into the skin. The lower lid is often invaded likewise, and the process is often bilateral. The plates vary in size from a mere speck to a patch as large as the finger nail; they are so soft that they cannot be felt when the finger is passed over them, and the skin in which they are embedded has its natural wrinkles, and is not scaly on the surface. The plates extend slowly for a time, then remain unchanged, as a rule, for the remainder of the patient's life. Sometimes, but not frequently, xanthoma planum, limited to the eyebrows, may be associated with the tuberous form of the affection.

In *xanthoma multiplex* the lesions, sometimes beginning on the eyelids, may appear on any part of the body, especially the limbs. The favourite points of attack are the joints, the palms and soles, the fold of the nates and the ano-genital region generally. They are nearly always nodular, but the flat form is occasionally met with, usually on the flexor surface of the knuckles, elbows, and knees. On the knuckles the growths have sometimes been found connected with the underlying tendons; in some cases they have been attached to the periosteum or the bone. The nodules vary in size from a pin's head to a pea; occasionally they are large enough to be called tumours. Striae, papules, and macules are sometimes seen; these are elementary forms of the typical plates and nodules. The lesions are occasionally grouped along the lines of flexion. In colour they vary through every shade of yellow; sometimes a mixture of blackish pigment with the yellow has been observed. In cases recorded by Köbner and others the lesions developed in capillary naevi, and had a reddish hue. Darier has met with xanthoma in a rhabdomyoma of the tongue, and Pollitzer in a similar tumour of the eyelids.

Xanthoma multiplex is unsightly, and on certain parts inconvenient. Sometimes there is a sensation of itching or burning in the patches, and if the nodules are exposed to friction there may be some pain.

*Xanthoma diabeticorum* is much rarer than the other forms. As I pointed out in 1883, in connexion with the fourth recorded case, it is remarkable for its rapid evolution and its swift and complete involution, as well as for its association with glycosuria. Besides the condition of the urine, the affection presents certain special features which distinguish it from ordinary xanthoma. The yellow spots are conical in shape, and are surrounded by a dull-red zone. They may be mistaken for acne pustules, but on puncture are found to be solid. They come out first on the extensor surfaces of the limbs, particularly on the elbows, then on the lower part of the back and belly, and on the buttocks. They are also seen on the genitals, on the palms of the hands, on the face and scalp, and, exceptionally, on the eyelids. The only subjective symptom is itching, which is more marked when the eruption is on the wane. The mucous membrane of the mouth is occasionally affected; the lesions appear rapidly, and disappear in a few weeks, but fresh crops are produced for some time. The patients are mostly young or middle-aged men, apparently in good health, but inclined to stoutness. As regards the constitutional state, it may be stated as a general law that there is, has been, or will be sugar in the urine. The skin affection is probably a toxaemic condition connected with the glycosuria.

**Diagnosis.**—Xanthoma of the *eyelids* is at once recognisable from the characteristic appearance of the yellow plates, embedded in the corium, and almost imperceptible to the touch. *Xanthoma multiplex* may be mistaken for urticaria pigmentosa. From that affection it is differentiated by the slight amount or absence of itching, and by the absence of wheals, past or present. In its early stage *xanthoma diabeticorum* may simulate lichen planus or acne, but the appearance and solidity of the yellow spots soon form distinctive characters.

**Prognosis.**—*Xanthoma palpebrarum*, when it has reached its acme, persists through life. In the *multiplex* form the disease usually progresses for a time, and then remains stationary. Spontaneous disappearance of the lesions has been known to occur, but with extreme rarity. In *xanthoma diabeticorum* the prognosis is favourable, so far as the eruption is concerned, if suitable treatment is applied.

**Treatment.**—Remedial measures are seldom effectual. The plates and nodules may disappear under the careful application of the galvano-cautery or the thermo-cautery. Good results have also been claimed for *x*-ray therapy. In xanthoma diabeticorum the treatment must, of course, be directed to the constitutional disorder.

XANTHOMA OF BALZER.—This extremely rare affection, of which the nature is quite unknown, is characterised by hypertrophy and deformity of the elastic tissue of the skin in limited areas, particularly the neigh-

bourhood of the larger joints, the axillae, the anus, and the bends of the elbows. The resemblance of the lesions to those of ordinary xanthoma is merely superficial. They consist of slightly raised patches, soft to the touch, and pinkish-yellow in colour, but without any red halo. In a case under my care, that of a young lady of twenty-one, the lesions appeared about puberty, on the left side of the lower part of the neck and the shoulder of the same side, and very slowly increased in number and size. Under the microscope the elastic fibres were seen to be much thickened, fibrillated, and knobbed. There was no inflammatory exudation, nor were there fatty cells. In Balzer's case, however, there was a slight inflammatory infiltration. The affection progresses slowly, and persists indefinitely, and no treatment has yet proved successful.

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# XERODERMIA PIGMENTOSA

SYNONYMS.—*Atrophoderma pigmentosum; Angioma pigmentosum atrophicum; Dermatosis Kaposi; Liodermia essentialis cum melanosi et telangiectasia; Melanosis lenticularis progressiva.*

By the late H. RADCLIFFE CROCKER, M.D., F.R.C.P.
Revised by A. WHITFIELD, M.D., F.R.C.P.

THIS is a very rare affection, but easily recognised by its striking characters and the comparative constancy of its symptoms. In the great majority of the cases there are five different lesions present. These are: (i) Freckle-like pigmentation, thickly covering the face, and the neck to just below the clavicles in front and to the shoulders behind. In the upper limbs, on the extensor aspect, it extends from the tips of the fingers to the lower third of the arm, extending upwards as far as the insertion of the deltoid; on the flexor aspect, the pigmentation slopes downwards from the back to just above the elbow, while the whole of the flexor surface of the forearm is thickly covered, except on the ulnar side, where it is less dense. The legs below the knee are affected, both back and front, but much less than the arms; the thighs are rarely involved. These limits are seldom exceeded, but as seldom is the pigmentation less extensive; it varies in tint from a pale yellow fawn to a deep sepia; and the size of the pigment spots ranges from a pin's head to a bean, the larger spots being irregular in outline. (ii) Small white atrophic spots in comparatively small numbers are interspersed among the pigment spots, but on the cheek, near the orbit, the atrophic spots may coalesce, forming larger areas of white shining thin scars. (iii) Bright red spots, flat or slightly convex, are interspersed over the white areas, and, though not numerous, stand out by contrast on the white ground. These spots are made up of dilated vessels, and stellate and striate red lines are also interspersed among the pigment, both of face and limbs. (iv) Small warts, often resembling senile warts, are scattered irregularly among the pigment spots; and from these at a later period tumours may arise. (v) Sooner or later there are superficial ulcerations with yellowish or greenish crusts scattered about the face, and ultimately, either from these or from the warts, tumours arise which, at first papillomatous, eventually may become carcinomatous, and destroy the life of the patient. Some of the sores appear to be derived from the purulent discharge from the eyes, in which conjunctivitis and vascular pterygium are very frequently present. The cicatricial contraction which ensues on the healing of the sores, whether this come about spontaneously or from treatment, leads to considerable disfigurement, and to some extent resembles that of lupus scarring. (vi) Papillomatous and carcinomatous lesions ultimately set in.

The disease usually begins in the first or second year of life; but a few have begun much later; 4 cases have been described by Falcao in

which the disease began late in life. The patients were all women, and their ages were respectively seventy-two, eighty-six, eighty-eight, and eighty-nine years. One of these patients was seen by Kaposi, who confirmed the diagnosis. The brother of one of the patients died of "cancer" which started in a freckle. The order in which the symptoms manifest themselves would appear from the records not to be constant, indeed our records depend for the most part on statements of patients' friends: according to some, the freckles are the first lesions, then the telangiectases, and then the white atrophic spots; but Brayton of Indianapolis saw a case begin in the sixth month of life with small white atrophic spots upon the face; some months later there was erythematous redness of the face and hands, and pigmentation rapidly followed. The pigmentation, the vascular and the atrophic spots are the most common features; the ulcerations, probably due to pus inoculation from the discharges of the eye, do not begin for some years subsequently; the warts are later still, and begin on the pigment spots; and the tumours, which may start either from the warts or from the sores, if benign at first, ultimately become malignant. The skin is dry and thin, but not xerodermatous in the ordinary sense of the word, therefore the disease has no relation whatever to a slight form of ichthyosis. A few of the cases are of a milder character, when the symptoms are almost limited to freckle-like pigmentation, without much atrophy or telangiectasis.

The **causation** of this affection is obscure, indeed little is known beyond the fact that there is a congenital disposition to it. On account of its distribution on the parts which in infancy are uncovered, and of the freckled character of the pigmentation, exposure to the sun is supposed by many to be an exciting factor; but, except in one case, the evidence in this direction is not conclusive, nor is the pigmentation limited to the parts exposed. The disease, although apparently of congenital origin, is not hereditary; it shews, however, a strong family prevalence. In a large family it is often limited to one sex, but on the whole the incidence upon the sexes is about equal.

**Pathogeny.**—The most probable hypothesis is that the disease is an atrophic degeneration of the skin dependent upon a defective innervation to which the patient is congenitally disposed. Most of the symptoms are of the same class as those associated with senile degenerations of the skin. White atrophy, telangiectatic tufts, freckle-like pigmentation, flat warts, and carcinomatous growths are all familiar incidents in the senile skin; and even the vascular pterygium of the eye is more common in the elderly. Mr. G. L. Cheatle has drawn attention to the prevalence of such atrophic changes, especially on the backs of the hands, and has named the condition "Biotripsis" or "Life wear." This condition is undoubtedly the result of exposure to adverse influences, the chief of which is strong sunlight. I recently saw a patient who had lived many years in the tropics, and whose hands shewed on the backs all the characteristic changes of xerodermia pigmentosa, namely, telangiectases, atrophic spots, warts, and probably squamous-celled carcinoma. The

elderly cases, described by Falcao and mentioned above, may form a connecting link between the comparatively frequent "biotripsis" and the rare xerodermia of early life.

The **diagnosis** will seldom be at fault if the existence of this disease be borne in mind, and the distribution of the freckle-like pigmentation and of the white atrophic and red vascular spots duly noted. The presence of these symptoms would distinguish it at once from lupus vulgaris, to which it bears a superficial resemblance in the cicatricial deformities of the later stage.

**Treatment.**—If seen early in life before the more serious changes have taken place great efforts should be made to preserve the skin from further deterioration. There is no doubt that the constant wearing of a coloured application which obstructs the more actinic rays of light is of great value. A grease paint heavily coloured with burnt umber seems to answer best, and darkened glasses should also be constantly worn to protect the conjunctivae.

Later much relief can be afforded by treatment of the superficial ulcerations, and by the removal of the tumours, before they take on a malignant character; the inflammatory conditions of the eye can be alleviated and kept in abeyance, and thus not only is the comfort of the patient promoted, but the removal of the purulent discharges, produced by the conjunctivitis, is also an important means of preventing many of the superficial ulcers. The eyes, therefore, should be diligently bathed with boracic acid lotion; the superficial ulcers should be scraped with a curette and strong carbolic acid freely applied; all growths appearing either on the sores or the warts should be promptly and thoroughly removed, after which they are not likely to recur in the same situation. Good results have been obtained in some cases from the use of the *x*-rays to remove the warts and heal the ulcers before malignancy has supervened. If this treatment be diligently and carefully followed up, the patient's comfort will be much promoted, and his life prolonged. If carcinomatous growths have occurred they should be promptly removed. In one case, that of Stern, a course of arsenic in the form of Asiatic pills was given—to the extent of nine milligrams daily—to a boy of twelve; and in four months three ulcerating tumours had disappeared, glandular enlargements had diminished, there was a general improvement, and the growths were apparently kept in abeyance for two years, during which time no fresh tumours arose. On the other hand, arsenic and other drugs have had a most thorough trial in many cases, without any benefit as regards the disease itself.

H. RADCLIFFE CROCKER, 1899.
A. WHITFIELD, 1911.

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A. W.

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## MOLLUSCUM CONTAGIOSUM (BATEMAN)

Synonym.—*Epithelioma contagiosum* (Virchow, Neisser).

By James Galloway, M.D., F.R.C.P.

Molluscum contagiosum is a cutaneous disease characterised by the growth of small tumours from the epidermis. It has been proved by clinical and experimental evidence that these tumours are contagious.

**Description.**—The tumours which are the characteristic feature of this disease vary in size from the smallest visible spot to that of a pea. In rare cases much larger tumours may be formed by the grouping together and confluence of smaller lesions. The individual lesions are hemispherical in shape, project distinctly from the surface of the skin, and possess a peculiar, firm, elastic consistence. Their colour varies—partly owing to the tint of the skin and to the situation which they happen to occupy—from shades of yellowish-brown to an opaque white, "mother-of-pearl" tint. They are often slightly translucent—a characteristic which increases the resemblance to a small mother-of-pearl button, to which they have been compared by Sir J. Hutchinson. Very early in the course of their growth they shew a minute depression on the summit, which becomes more obvious as the tumours increase in size. This depression at length forms the orifice of a narrow passage to the centre of the tumour, which becomes occupied by epithelial debris, the result of a peculiar and characteristic degeneration which the epithelial cells composing the tumour undergo. From the orifice of this channel the degenerated epithelial cells escape, or can be readily expressed as a greyish-white, caseous material. Occasionally the contents of the tumour are of firmer consistence, and can be forced out as a plug. The channel thus described resembles the duct of a gland, of which the softened central area of the tumour simulates the distended acinus. Occasionally more than one orifice and channel may be distinguished, leading to the softened centre of the tumour.

These tumours may arise on any part of the skin, but are most frequently observed on parts exposed to contagion; thus the face is perhaps one of the commonest sites of the disease, especially in the case of children. The upper part of the trunk, forearms, and hands are also favourite localities. The breasts in the case of nursing women may become inoculated. In adults the genital organs, the groin, and inner surfaces of the thighs may be severely affected; occasionally the small tumours are distributed in large numbers over the whole body. Very rarely they have been observed on the red surface of the lips, and even on the buccal mucous membrane. The disease may occur at all ages, an infant of ten weeks is recorded by zum Busch as shewing the disease. Children are more frequently affected than adults, but it is not uncommon to find it in adults of all ages and both sexes, and many cases have been observed in old people. It is more commonly observed in the poorer classes who are obliged to live too closely crowded together, or in institutions or schools for children, especially when the rules of personal cleanliness are carelessly observed. But it occurs in all classes of society if exposure to contagion has happened. Thus it is not infrequent to find the disease affecting persons in good circumstances, who are careful in matters of personal cleanliness, on their return from travelling with its risks of contagion.

**Contagion.**—The disease is now proved to be inoculable and, therefore, contagious. From a very early period this was suspected, and the name which the disease has retained ever since Bateman's time gives the opinion of this physician, but for long the evidence of its inoculability was purely clinical.

*Clinical Evidence.*—Many observations of the transference of the disease from one individual to another are on record. These observations date from the time of Bateman and have been added to by Thomson, Paterson, Henderson, and Cotton, among older observers, and by Sir D. Duckworth and many others in more recent times. This evidence may be grouped under the following heads:—

(1) Transmission from One to Several Members of a Household, and from Household to Household.—Numerous instances are recorded of one child after another in a family becoming affected; of nurses communicating the disease to children under their charge; of mothers and wet nurses suffering from the disease on the nipple and breast infecting their nurslings on the face, and of the converse; of husband and wife being affected by the disease simultaneously. An interesting example of conveyance of the disease from one individual to another is given by Neumann. A group of cases consisted of mother and twins, infants at the breast. The disease shewed itself in one of the infants, who communicated it to the mother's breast, and by this means the other child became infected. In reference to its occurrence on the genitalia, it is noteworthy that there is a tendency among some observers, especially on the continent of Europe, to classify the disease definitely as a communicable venereal affection.

(2) Spread of the Disease in Schools, Hospitals, and other Public

Institutions.—Numerous examples of outbreaks of the disease in the children's wards of hospitals, and in schools are on record, and, no doubt, many more might be quoted in evidence. I remember that at one time the demonstrations on diseases of the skin in the Royal Infirmary, Aberdeen, were illustrated, session after session, with recent examples of the disease from a reformatory school for boys in the vicinity of the city. Evidence of the same character is afforded by outbreaks of the disease which may be traced to public baths and wash-houses.

Of the cases occurring in persons living in good circumstances, a considerable number seem to be traceable to the use of Turkish baths. In such cases the use of infected towels may be the source of infection. It must not be overlooked, however, that the risk of contagion would be very considerable should a masseur in a bathing establishment be the subject of the disease. Very often the disease, when slight, gives rise to but little inconvenience, and the small tumours are regarded as warts on the hands. The hands of a masseur with such "warts" would be a very efficient means of inoculating molluscum contagiosum.

(3) Accidental Inoculation. — Several instances are recorded of physicians and others concerned in the treatment of the disease inoculating themselves accidentally. Brocq is quoted by Stelwagon as follows: "I inoculated myself involuntarily with molluscum with my nails after having pressed out with the nails of the two thumbs the contents of a lesion of molluscum in a patient. Soon afterwards I inadvertently scratched my face. About a month and a half later several lesions of the molluscum developed in this region."

(4) Experimental Evidence.—The most important evidence of the contagious nature of the malady is that afforded by the considerable number of successful experimental inoculations which have been made. Instances are recorded by Retzius, Paterson, Widal, Stanziale, Pick, Haab, and Nobel. From the records of these successful results, it must be concluded that the disease is not inoculated easily, for many unsuccessful efforts were made by these observers. Great care was taken by some to keep the substance of the molluscum in contact with the sound skin. Occasionally the inoculations were successful after rubbing the infective material into the skin. Others found it necessary to inoculate the material obtained from the tumours after scarifying or puncturing the healthy integument. The incubation period seems to be very variable, and, judging by the result of these experimental inoculations, occasionally very long. It varied from perhaps four weeks in Nobel's case to six months in the case of Haab, the usual period being from six weeks to three months. So far as can be judged from the clinical records natural methods of contagion may require a somewhat shorter period of incubation. It is noteworthy, however, that at first the rate of growth of the tumours is very slow, so that they are readily overlooked. Thus, Allen states in reference to the case of accidental inoculation in which he was himself the sufferer, "After they (the lesions) were big enough to attract my attention (mere specks) it took them six weeks to attain a size from

which a clinical diagnosis could be made." Recent experiments have confirmed these opinions. Amongst the most interesting are those of Juliusberg, who has found that the virus of the molluscum contagiosum is capable of being filtered, and that the filtrate contains the contagion in a virulent form. Juliusberg inoculated three individuals with the filtrate from molluscum tumours. In one case, after fifty days, numerous lesions of molluscum developed at the point of inoculation (1905). Similar experiments carried out by Serra corroborate the results obtained by Juliusberg. Serra used a Berkefeld filter for his filtration experiments, and found that in the filtrate so obtained there were minute particles colourable by the Giemsa stain. Serra found the period of incubation to be ninety days. In Juliusberg's case it was shorter, and he considers that the incubation period is twice as long on using the filtrate than when direct inoculation of the tissue is made. The large number of unsuccessful inoculations which have been made from time to time by many observers must not be permitted to weigh against positive results now on record.

The contagious elements concerned in the disease have not yet been identified, and there are no indications as yet that they exist external to the tumour or the human body. There is little doubt, however, that they are directly inoculable, though with a considerable amount of difficulty. In view of the more recent knowledge gained of parasitic, and especially protozoan infections, the existence of the virus of molluscum contagiosum elsewhere than in the human subject must be borne in mind, and the possibility of its being conveyed from place to place, and from individual to individual, by one of the human parasites cannot fail to be regarded as a probable conjecture. It is worthy of remark in this connexion that it has long been known that certain animals, especially birds (pigeons, domestic fowls, etc.), suffer from a disease affecting the head, beak, and neighbouring parts, and also the claws, very similar in appearance to molluscum contagiosum, which has frequently been described as epithelioma contagiosum of birds (Bollinger, L. Pfeiffer). There are, however, considerable differences in the microscopic structure of these tumours in birds from those observed in human molluscum contagiosum. Nevertheless, cases have been described of persons handling birds who became affected with epithelial tumours resembling the original growths in birds (Salzer), and Juliusberg has shewn that the virus of the epithelioma contagiosum of pigeons and of domestic fowls is filterable and inoculable, as in molluscum contagiosum.

**Histology.**—The amount of discussion which has taken place as to the structure of molluscum contagiosum is far in excess of its actual clinical significance, and has been greatly stimulated by the difficult pathological problems arising as to the infectivity of this growth. For a long time after the identification of the disease and its lesions, and after its contagious nature had received almost complete clinical proof, the tumours were considered to take origin from the sebaceous glands—to be a form of hypertrophy of these structures. The aspect of the tumours, their peculiar curdy contents, and especially the appearances they present

on naked eye dissection, and even on microscopical examination, lent a considerable amount of support to this opinion. As methods of microscopical examination became more perfect, the data supporting this opinion were gradually corrected, and the observations of Bizzozero and Manfredi in Italy, Retzius in Stockholm, Boeck of Christiania, Lukomsky in Kieff, and Sangster and Thin in this country did much to present the histology of this subject in its proper light. It is worthy of notice, however, that two observers so accomplished as Drs. Tilbury and Colcott Fox wrote a vigorous defence of the hypothesis of the sebaceous gland origin of these tumours so recently as 1879. All more recent observations

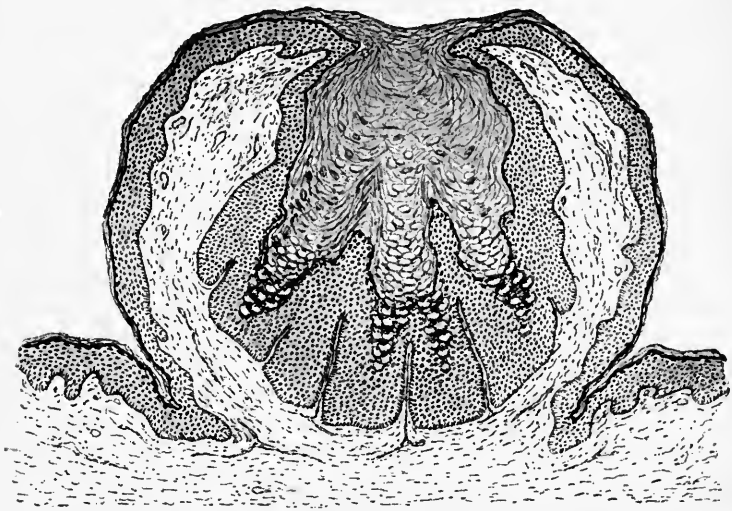

FIG. 137.—A section of a tumour, shewing the general microscopical structure of Molluscum contagiosum.

have served to confirm the opinion that molluscum contagiosum does not arise from an overgrowth of the sebaceous glands.

The following account, corroborated by my own observations, gives the present view of the growth of the molluscum tumours. The proliferation of cells producing the tumour takes place in the rete Malpighii, and may originate at one point or at several points in close vicinity. In some cases it appears that this multiplication of cells may occur in the corresponding layer of epithelium in the walls of a hair follicle. The result of the rapid multiplication of the epithelial cells in this position is to flatten the underlying papillae, so that the little tumour presses out for itself a depression which varies in depth according to its size. As a rule all the papillae disappear, although traces of them remain and give rise to certain of the more substantial of the thin fibrous partitions which are very obvious at the lower part of the tumour, defining and emphasising its lobular structure. The cells of the interpapillary

epithelium multiply as well as the cells of the rest of the rete, and these, being at first confined by the papillae, form lobulated masses, and thus produce a rough imitation of the lobules of a sebaceous gland. Gradually the papillary processes of the cutis become flattened out and atrophied by lateral pressure, and the lobules of the tumour come to lie very close together. Probably some of the short fibrous trabeculae seen in the lower portion of the tumour may be produced by the infolding of portions of the cutis between the rapidly-increasing masses of epithelium in the stratum mucosum. It is noteworthy that these rapidly-growing areas and masses of epithelium always retain a rounded or blunted outline, and do not shoot downwards the root-like processes so characteristic

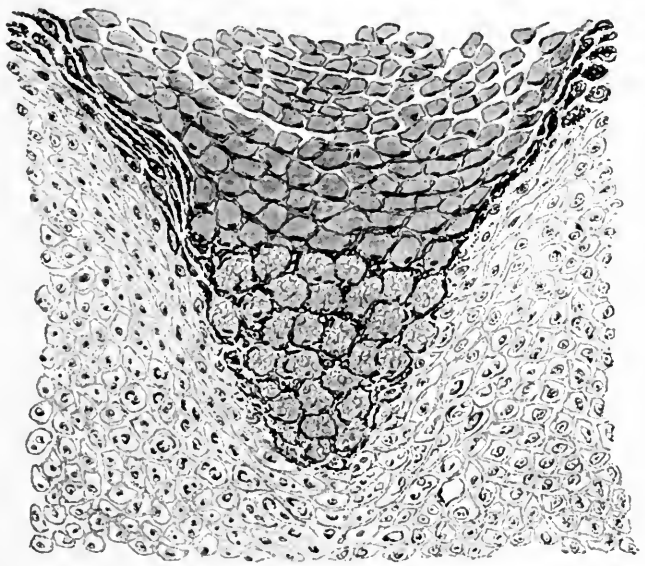

FIG. 138.—An area of epithelium from the above section further magnified to shew the characteristic epithelial degeneration leading to the appearance of the "molluscum body."

of epithelioma of the malignant type. For the same reason the rapidly-dividing epithelium presses upwards and raises the overlying layers of the characteristic hemispherical tumour. This elevation is intensified by the fact that the cells of the proliferating stratum mucosum as they become horny do not shrivel up as in the case of the normal horny layer of the skin, but remain distended with hyaline material resulting from a peculiar degeneration of their protoplasm. As the tumour increases in size one or more depressions or umbilications are observed on the surface, due to the falling in or folding inwards of the most projecting point. This process is facilitated, no doubt, by the projection upwards of the multiplying cells from the base of the tumour. The umbilications so formed in the course of the growth of the tumour lead downwards into the

cavity filled with the peculiar horny cells already mentioned, and thus it is that the appearance of a duct leading into a gland which has become transformed into a retention cyst is so closely simulated.

On microscopical examination of the interior of the tumour several abnormal appearances are observed. The cells of the rete are large, and may even appear distended as the result of a peculiar form of hyaline degeneration of their protoplasm. This is specially noted in the upper layers of the rete. The contents of the cells shew a tendency to push the nuclei against the cell wall. The cells are otherwise normal and shew their "prickle systems" as in the normal skin. The stratum granulosum with its kerato-hyaline granules is not only present, but is more obvious than usual, the cells being large and the granules unusually coarse. The cells of this layer are regularly arranged till the tumour undergoes softening, when slight injury readily destroys their regularity. Above the stratum granulosum, cells, representing the stratum lucidum containing eleidin, may be identified. Thus the keratinisation of the rapidly-multiplying epidermic cells of the stratum mucosum goes on in the normal manner, and the stratum corneum is quite obvious, but it is noted that the cells of the horny layer do not collapse and become squamous in the normal manner. They are distended with the hyaline material already noted as appearing in the upper "prickle cell" layers and surrounded by the firm horny cell wall. Occasionally the fragments of the nucleus can be observed adhering to the interior of the cell wall; the cells themselves are not firmly adherent as in the normal stratum corneum, but lie more loosely in the interior of the tumour. These capsule-like cells, filled with hyaline material, form the characteristic curdy contents of the tumour; they have long been recognised as peculiar structures. The name of "molluscum bodies" was given to them so far back as the time of Paterson, but attention has again been directed to their presence by Neisser, Darier, Bollinger, and others. These authors at one time considered that the molluscum bodies were produced by and contained a protozoan organism, relying on certain rough resemblances to the parasitic protozoa of many of the lower animals and to the coccidium oviforme and other protozoan parasites in mammals. On staining the tumours by appropriate methods, it is observed that the cells of the rete early in their existence begin to shew a peculiar degeneration of their protoplasm. This degeneration is seen in both the nuclear and perinuclear protoplasm, and, on account of the inability of the spherical degenerate areas to take staining reagents in the same way as the healthy protoplasm, it gives rise to the hyaline rounded areas to be observed within the cells. Several of these points of degeneration may occur in the same cell, and as the hyaline material makes its appearance the healthy protoplasm vanishes. At the same time the arrangement of the chromatin filaments in the cell is disturbed, and the nuclear chromatin is apt to be pressed on one side. This process of degeneration is obvious through the stratum granulosum. On passing upwards more of the hyaline material is seen, sometimes arranging itself

in a botryoid form. As the stratum corneum is reached the globules of hyaline material have run together, and the epithelial cell with its horny envelope is distended with hyaline substance, the whole "molluscum body" having an oval or rounded form. Traces of nuclear chromatin may still be discerned as fragments and narrow borders reacting to nuclear staining reagents, attached to the walls of the cells or pressed tightly against the horny envelope.

As the horny cells form they lose their "prickle systems" and become less adherent to each other than is normal in the stratum corneum; at the same time the hyaline substance renders them soft, so that a little pressure on the tumour causes the central mass to be forced out as the curdy material which is so characteristic. The contents of the tumour have the lobulated structure corresponding to the lobes of the tumour itself. At or near the orifice leading to the interior of the tumour, and intermingling with the molluscum cells, it is not difficult to demonstrate the presence of bacteria. They consist of various forms of cocci and bacilli, but are present only accidentally. Their presence, however, serves to explain the ease with which suppuration may be brought about in the little tumours. The horny cells of the molluscum tumour with their hyaline contents are the structures at one time believed to be of protozoan origin. It must be stated, however, that none of the authors who at one time supported this explanation succeeded in demonstrating changes in any degree resembling the cell divisions of the known protozoa, either within the tumour or external to the body. Critical examination has shewn that they originate in the manner already described, and the explanations given of their protozoan relationships cannot be upheld. It can, however, scarcely be doubted that the growth of molluscum contagiosum is due to the influence of some parasite, and the discovery of the parasite, its mode of implantation, and its influence on the epithelium must be an event of much pathological importance on account of the light it may shed on other forms of epithelial overgrowth.

**Clinical Course.**—The tumours increase slowly, frequently taking several weeks, or it may be even months, to attain their full size, and, if uninterfered with, remain in a passive condition for an indefinite period. Slight injuries, however, cause their destruction; they may be easily torn out of the skin when mature, or they may become infected with pyogenetic organisms and suppurate; in the latter case much inconvenience and pain may result. The tendency of the tumours, after reaching what may be considered as the average size of a pea, is towards retrogression and disappearance by accidental causes. They do not leave scars, except when they suppurate, but then disfiguring cicatrisation may result, especially if such localities as the eyelids or other parts of the face are affected. In rare instances the tumours, by coalescence and perhaps by a tendency to unusual increase of individual lesions, form larger masses, so that regular nodular excrescences on the skin are formed. Such tumours have been noted as occurring in the groin, the inner surface of

the thighs, and especially the scalp. These large growths discharge quantities of the epithelial debris produced in their interior, and tend to suppurate. The tumours so formed differ greatly from the usual type of lesion, and shew superficial resemblances to more malign forms of growth.

**Treatment.**—The treatment is fortunately simple and effectual. The pathogenetic material is not of great vitality nor virulence, and any method of treatment which diminishes its amount or lowers its vitality is sufficient to interfere with the production of the epithelial growth; thus, in many cases, it is sufficient to express the contents of the growth, when the small tumour will collapse and in a few days shrivel up and disappear, without leaving any appreciable scar. So also the introduction of a drop of pure phenol, or of a solution of the acid nitrate of mercury, will in many cases suffice to destroy the tumour.

In other cases a satisfactory method of treatment is to split the small tumours to their bases with a suitable sharp knife, emptying them of their contents, if necessary, by means of a small curette. If the incision has passed beyond the limits of the tumour, as is probable, the small amount of haemorrhage will be readily controlled by means of pressure with a pad of lint. When the tumours are few the methods of treatment suggested are easily and effectively employed. There are, however, certain precautions to be observed, and difficulties arise in certain cases. It is important in any of the methods of treatment adopted to keep within the limits of the tumour as closely as possible. If care is taken to do this, little or no scar will result. Precautions must also be taken to prevent suppuration, which is occasionally troublesome. This is especially liable to occur among the children of the poor, in whom the disease frequently occurs, and who may be careless in matters of personal cleanliness. Occasionally the best procedure is to excise the tumour by means of a knife or scissors curved on the flat. This is especially the case when the tumours occur about the eyelids or on folds of the skin, such as in the axilla or the groin. A clean cut is obtained, and thus suppuration is more easily avoided. Troublesome purulent conjunctivitis is apt to occur as the result of suppurating molluscum contagiosum of the eyelids. In many cases the tumours are numerous, being counted by the score, and widely distributed over the whole surface of the body. In such cases the most satisfactory method of treatment is to destroy the individual growths by means of the point of a fine cautery. The electric or benzene cautery is well suited for this purpose, and the point used need not be larger than a fine knitting-needle. The glowing point should be inserted into the small orifice of the tumour, and passed through to near its lower limit. In the case of the smaller tumours such a touch is sufficient. In the case of others of larger size a slight lateral or circular movement of the point may be necessary. Care should be taken to retain the point of the cautery within the limits of the tumour. If properly performed the tumour is destroyed, its remains shrivel and drop off the skin, and little or no scar remains. Even when

the tumours are very numerous, and the patient may be supposed to object seriously to the infliction of pain, this operation can be carried out in a few sittings with complete success, and offers the most rapid means of obtaining a satisfactory result. The cauterisation must be carried out, however, with gentleness and precision so as to avoid scarring. Suppuration must also be prevented by the methods at our disposal. When such localities as the axilla, the groin, the perineum, or genitalia are affected, rest for a day or two will be necessary so as to prevent chafing of the cauterised points and consequent purulent inflammation.

Electrolysis has also been used in the treatment of the disease, and occasionally may be of service. The fine point of the actual cautery produces no more pain and is more efficient in careful hands.

In the case of the larger masses, known as giant molluscum, freer excisions may be necessary, but even in such cases treatment of the individual nodules which, by coalescence, have produced the larger tumours by such methods as have been described will markedly lessen the mass of growth, or even cause it to disappear entirely.

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## DARIER'S DISEASE

SYNONYMS.—*Acne sebacea cornea* (E. Wilson); *Keratosis follicularis* (White); *Psorospermosis follicularis vegetans* (Darier).

By J. J. PRINGLE, M.B., F.R.C.P., and E. GRAHAM LITTLE, M.D., F.R.C.P.

**Definition.**—A rare disease of the skin, characterised in its earlier stages by the existence of minute papules which later become covered with horny scales, often with a central umbilication which has been regarded as corresponding with the orifice of a pilo-sebaceous follicle; hence the name Keratosis follicularis. Later observations on the histology of the disease have, however, demonstrated that the situation of the papules is not necessarily follicular. The causation is unknown.

**Historical.**—The first description of the disease was made in a thesis entitled "Observations cliniques pour servir à l'histoire de la Psorospermose folliculaire végétante de Darier," Paris, May 8, 1889, by Thibault, a pupil of Darier, the cases described having been under the observation of the latter. In June 1889 White narrated a case, under the name Keratosis follicularis, which was later recognised to be the same disease as Darier's "psorospermosis." In July 1889 Darier published a clinical and histological description of the two cases which had formed the subject of Thibault's thesis; he described certain round bodies which formed a striking feature of the sections examined, and stated his opinion that these were coccidia, and that the disease was a cutaneous psorospermosis. Bowen demonstrated the presence of eleidin in the round bodies which had been described as coccidia, and his denial of the psorospermic causation was confirmed by the researches of Boeck, Buzzi and Petersen, and was subsequently admitted by Darier himself. There is at present a general consensus of opinion that the disease is of the nature of a dyskeratosis, and that the round bodies which had been described as coccidia are in reality degenerated epithelial cells.

The disease is certainly not so rare as it appeared to be at first; about 70 cases have been recorded up to the present time, and the number is being continually increased.

**Etiology.**—The cause is unknown. The disease is not contagious: it is probably capable of hereditary transmission, and may occur in more than one member of the same family, as in Boeck's and White's cases. In a certain number of instances mental insufficiency has been noted in association with this disease. The majority of cases have occurred in patients of the lower classes, and in adults, males being slightly in excess of females. In 33 cases collected by Dufort, 13 were females, 20 males; 26 of the 33 patients were over twenty-one years of age.

Darier has suggested that the disease may be due to a functional insufficiency of some organ with an internal secretion, and recommends the trial of opotherapy and thyroid extract, in addition to local measures. Audry and Danlos found a diminution of the quantity of sulphates eliminated in the urine, and suggested that, as sulphur is a normal constituent of keratins and is excreted by the skin, there may be some association between the decrease of sulphur eliminated and the abnormal keratinisation present in Darier's disease.

**Morbid Anatomy.**—Microscopic examination of sections through the growths shews that the lesions are situated chiefly, but not exclusively, at the neck of the pilo-sebaceous follicles. The neck of the normal follicle, which is really an invagination of the epidermis, is lined by epithelium similar to that of the surface of the skin; so that the Malpighian layer, the stratum granulosum, and horny layer are in contact with the hair. In Darier's disease the neck of the follicle is dilated, and the crater-like orifice is filled with a coherent peg of horny material through which the hair generally passes. This horny mass corresponds to the adherent plate, and to the horny plug which fills up the duct. There is also a papillomatous proliferation of the lateral walls of the follicle, the cells undergoing a horny change and thus forming masses which may press upon the rete mucosum and cause its atrophy. The granular layer is often deficient in the central area of the lesion. The cells of the deeper layers of the rete mucosum often shew caryokinetic changes, and are in a condition of active proliferation, so that the rete mucosum, as a whole, is considerably thickened. The prickle cells in the neighbourhood of the lacunae, which are found here and there over the papillae, have lost their characteristic prickles and are scattered about irregularly, their nuclei staining feebly or not at all; elsewhere the prickle cells are normal. In positions such as the hypogastric region, where the lesions attain a greater size, the pathological changes are still more marked. The dilatation of the upper parts of the sebaceous ducts is so great as to give rise to the formation of cysts, from the sides of which ramifications project into the corium, so that an appearance more or less closely resembling an epithelioma is obtained. Darier states that in his cases the hair follicle below the opening of the sebaceous gland, and also the sebaceous gland itself, did not present any abnormal characters; no signs of retention of secretion were to be seen, nor was there the least trace of peri-follicular cellular exudation to indicate any degree of irritation under the influence of the plug which blocked the orifice of the follicle.

Since the horny plugs are found in the absence of papillomatous proliferation, it is evident that this latter process is secondary. The follicular keratoses—such as ichthyosis follicularis, lichen pilaris, and pityriasis rubra pilaris—in which the hair follicle is blocked by horny material, do not shew any similar appearance.

The most characteristic feature of the histology of the disease is the presence of numerous small round or oval bodies in the spaces between the prickle cells of the rete mucosum (Fig. 139). They are larger than

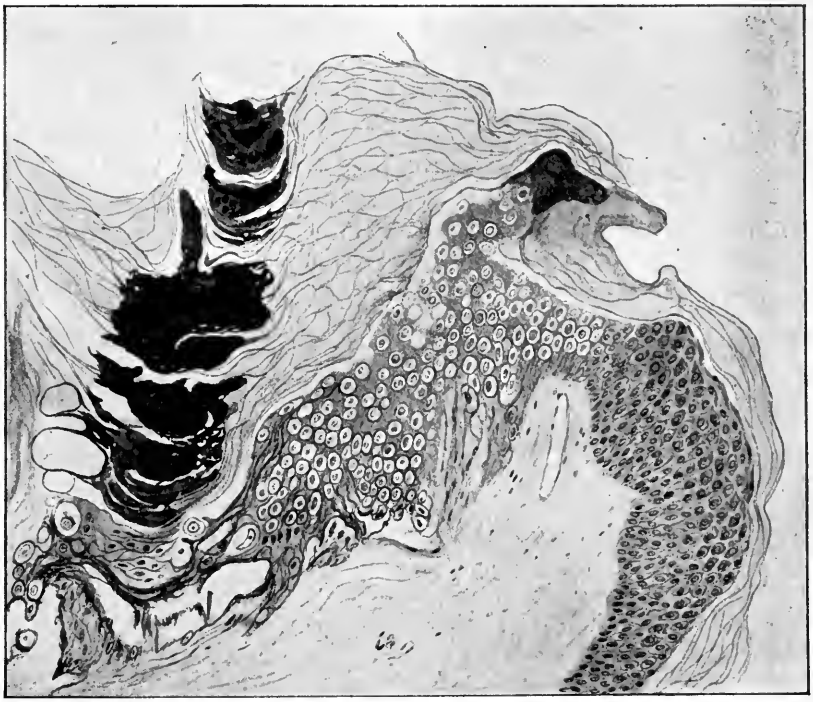

FIG. 139.—Drawing of microscopical section of the skin in Darier's disease shewing the characteristic "round bodies in the epidermis."

epithelial cells, and stain well with Lugol's solution, with haematoxylin, with congo-red, and with nigrosin. These bodies, though found in other diseases, never occur in such large numbers as in Darier's disease. They consist essentially of cells with a nucleus surrounded by protoplasm enclosed by a shining membrane, occasionally by a second concentric shining membrane. These membranous envelopes stain like keratin, and grains of kerato-hyaline have been found in the contents of the cells. They present all the features of "cells which have undergone hasty, incomplete, and irregular keratinisation." The pathological process to be observed in the disease would, therefore, appear to consist of "a primitive

alteration of the Malpighian layer, resulting in a hasty and atypical keratinisation of a large number of cells with degeneration and acantholysis of others; and, secondarily, a considerable papillary hypertrophy" (Darier).

**Symptoms.**—This cutaneous eruption may be found on any part of the body, but there are certain regions in which its presence is most frequent. In the hypogastric and inguinal regions it spreads most extensively, and its occurrence is especially common upon the scalp and face, presternal region, and hairy parts generally. It begins with the appearance of solid papules about the size of a pin's head, which do not differ much in colour from the surrounding skin, but are readily appreciated by the touch. These papules become pinkish as they enlarge, and are capped by brownish hard crusts of horny consistence, with an umbilicated centre. The elementary lesions are frequently, but not exclusively, situated at the orifice of the pilo-sebaceous follicles; and, when the plugs have been removed, sebaceous matter may at times be made to exude on pressure. These papules or nodules may run together and form tumours, which are covered with more or less greasy, brownish dark scales, increasing in places into definite spine-like protrusions, and even forming small horns as much as half an inch in length. The lesions are usually well marked in the regions of the hypogastrium, perineum and anus, where they sometimes increase in process of time into large papillomatous tumours which ulcerate and discharge. Such tumours arise from hypertrophy of the papillae and of the epithelial masses which have grown at the necks of the follicles.

The horny masses may, in certain positions, as on the dorsa of the feet, change into smooth brownish plates raised above the surrounding skin. The palms and soles, and even more exceptionally the backs of the hands, may likewise become covered with horny plates formed by the coalescence of several wart-like masses with a horny translucent covering. Darier described the corneous layer as becoming thickened over the papillae, and forming numerous yellowish points. The nails almost always present longitudinal furrows, and their edges are irregular, jagged, and broken; and Boeck has stated that this condition of the nails may be present even when the disease has not attacked the surrounding skin. The horny character of the lesions on the dorsa of the hands and feet contrasts with the soft greasy feel of the scales covering the papillomatous growths on moist covered parts, such as the axillae, where the sweat macerates the horny masses, which may easily be rubbed off, exposing a moist, red warty surface. These greasy scales are also seen sometimes on the scalp, where yellowish crusts form, and the lesions may somewhat resemble an eczema. Subjective sensations consist chiefly of itching, whereupon the lesions become complicated with those of scratching. In certain situations acute pain may result from the ulceration, and may interfere with the patient's general health.

The mucous membranes are usually intact, but a prolongation of the papillae of the tongue and hypertrophy of the mucous glands of the lips have been noted.

**Prognosis.**—The progress of the disease is slow, and may last for years, the older lesions growing gradually larger and new foci springing up from time to time. Acute exacerbations are marked by the presence of papules scattered over large surfaces; and, finally, either in this manner or by the steady growth of the primary lesions, the greater part of the cutaneous surface becomes affected. The general health is, as a rule, but little impaired.

**Diagnosis.**—The fully-developed disease presents no difficulties in diagnosis, but not infrequently the initial papules are mistaken for other diseases such as ichthyosis follicularis, lichen planus, or lichen (keratosis) pilaris. In some cases also a possible confusion with hyperkeratosis of the sweat pores due to other causes—or porokeratosis, according to Unna's nomenclature—may arise; but the clinical features of the case and a histological examination will always determine the diagnosis. It is probable that some cases described as Darier's disease have been examples of the still rarer affection, acanthosis nigricans.

**Treatment.**—No method of treatment, up to the present time, has been found to give satisfactory results in this affection. The disease steadily progresses in spite of treatment, though some amelioration of the discomfort may be obtained. The crusts and scales must be got rid of by soaking in boracic or alkaline baths, and softening with applications of carbolic oil. Crocker recommended inunctions of soft soap, followed by baths of potassium sulphide. Boeck, to freely discharging lesions, applies an ointment containing starch and subacetate of lead; or, to those parts where the disease is less advanced, an application of Lassar's paste. The patches on the dorsa of the feet and the backs of the hands may be painted with salicylic collodion or, according to Jarisch, with salicylic soap plaster. In some cases an ointment similar to the following may be of service: Ichthyol, ac. salicyl., terebinthinae āā ʒiij, camphorae ʒj, ung. diach. ʒvj.

Schwimmer has made use of the thermo-cautery to clear away the growths.

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## ACANTHOSIS NIGRICANS

By Sir MALCOLM MORRIS, K.C.V.O.

AN extremely rare disease characterised by roughening of the skin, with wart-like growths, disseminated or agminate, and a peculiar dark discoloration. It was described in 1890 by Pollitzer and Janowski, and was named by Unna. Darier had previously described the affection under the name *dystrophie papillaire et pigmentaire.*

**Etiology.**—The causation of acanthosis nigricans is still involved in obscurity. But in the great majority of cases—Darier gives the proportion as 25 to 30—it is associated with malignant disease in the abdominal cavity, either primary or secondary, and Darier has suggested that in such cases it is due to the action of the malignant growth on the abdominal sympathetic. In a case described by Pawlow, the patient, anaemic and emaciated, complained of pain on deep pressure over the epigastrium, but there was no certain proof of visceral cancer. The affection appears at least twice as often in women as in men, and in most cases between the ages of thirty-five and forty-five. In the four or five cases of acanthosis nigricans in young children, it has not been related to malignant disease. G. Hügel has reported a case in which the patient, a man of twenty-five, began to suffer from the malady at the age of three, but had never shewn any sign of visceral disease.

**Morbid Anatomy and Pathology.**—These aspects of the affection are still imperfectly understood. In structure the warty growths have the ordinary characters of papilloma. In a case under my care microscopical examinations of scrapings of the pigmented skin were made by Mr. Jackson Clarke, who found in them (1) epidermic scales, yellowish in colour, with hyphae of fungi, spores, etc.; (2) a large number of black, opaque, angular, and irregular particles; (3) a few brown translucent granules resembling amorphous haematoidin. He came to the conclusion that the brown masses probably consisted of haematoidin from minute intra-epidermic haemorrhages, whilst the black masses were certainly adventitious. In one of Darier's cases, in which a necropsy was performed,

the suprarenals were apparently healthy; but the nerves going to the capsule on each side were in contact, close to the gland, with cancerous growth. In another necropsy (Kuznitzky's case) the suprarenals were rather large, smooth, and red: in the right one there was a cavity, the medullary substance was red, and there was a thin greyish-yellow cortex.

**Signs and Symptoms.**—The lesions are regional and symmetrical. The first thing that attracts the patient's attention is harshness and bronzing of the skin about the neck and front part of the body generally. Soon patches of deeper discoloration appear here and there. In the axillae and at the umbilicus, on and about the breasts, and around the anus and genitals, there spring up masses of wart-like vegetations, generally blackish in hue, except where excoriation or fissure has produced a red raw surface. From the depths of the fissures there sometimes oozes a viscid discharge. On the back of the neck, the chest, the abdomen, perineum, inner parts of the thighs, and in the bends of the elbows and knees, are seen areas of staining on which the shade varies, according to the natural colour of the skin, from dirty brown to ebony black. The natural lines of cleavage are deepened owing to thickening of the skin, which is dry and harsh to the touch, and thickly dotted, in many cases "peppered," with warts, both sessile and pedunculated; these are seen on the face, in the ears, and on the limbs and body in places where there is no definite staining, as well as on many of the discoloured patches. The hands and feet exhibit similar changes, though as a rule less marked. The nails become thickened, dull, striated, and brittle; and the finger-ends are often deeply cracked. The hair becomes dry and wiry, and sometimes turns grey; as the disease goes on it falls out, not only on the head, but over the whole body also. In the patient under my care, a woman aged thirty-five, while the hair on the head was falling out, a thick growth of white hair took place on the face, and to a less extent on the chest and abdomen. The mucous membrane of the mouth becomes dry and wrinkled, and warts form on the palate, gums, tongue, and inside the cheeks. The tongue is swollen and fissured, and the thickness of the mucous membrane covering the interior of the mouth causes discomfort and slight difficulty in the movements of the tongue and lips. The mucous membrane of the vagina in my case, and in some of the others that have been recorded, was covered with warty growths similar to those seen in the mouth. The mucous membranes, however, do not present the characteristic staining seen on the skin.

The skin gives to the touch the sensation of morocco leather; and, on pinching it up between the thumb and forefinger, it is palpably thickened and the folds cannot be obliterated by stretching. On close inspection the discoloration is seen to be due to the presence in the superficial layers of the epidermis of numerous black granules. There is no constant relation between the warty masses and the staining, some warts not being discoloured, and some black patches not being warty. The pigmentation generally follows the lines of cleavage and flexure. As a general rule, the patches are seen on flat surfaces of skin, and the warty

masses are found in hollows, such as the armpit, where warmth and moisture favour their vegetation. Other lesions—naevi, seborrhoeic warts, molluscum pendulum—are not infrequently found coexisting with those just described; but the association seems to be merely accidental.

There is generally no pain referable to the condition of the skin, except occasionally in the fissures; in one case itching was troublesome. The patient is, however, generally in a bad state of health when the skin affection first shews itself, the symptoms pointing either to serious disease of the stomach (obstinate dyspepsia, frequent vomiting—often "coffee grounds" in character—pain), or of the uterus (leucorrhoea, pain).

As the affection progresses, the warty growths become more luxuriant, and spring up in fresh places; the patches of hypertrophied skin come to resemble that of the scrotum when fully contracted, and may even assume the gnarled appearance of the bark of an old oak.

**Diagnosis.**—Acanthosis nigricans, once seen, can hardly be mistaken for anything else. The only conditions which in any way resemble it are Addison's disease, Darier's psorospermose folliculaire végétante, and arsenical pigmentation. In Addison's disease, however, the skin, though bronzed, is not rough or warty; the discoloration has not the peculiar distribution seen in acanthosis nigricans, and in particular the mucous membranes may be pigmented, which is not the case in the disease under consideration. In Darier's disease the lesions consist of closely aggregated papules covered with crusts, and the characteristic round bodies and granules can be seen with the microscope. Moreover, there is no associated intra-abdominal malignant disease. Arsenical pigmentation is more diffuse than the staining of acanthosis, and there is a history of arsenical medication. The correct diagnosis of acanthosis nigricans is of special importance on account of its connexion with grave internal disease. In any case presenting the symptoms described, the most careful examination of the abdomen and pelvic organs should be made; even if nothing be found, the skin affection must be looked upon as the probable forerunner of internal malignant disease.

**Prognosis.**—In cases in which the affection is associated with malignant growth the prognosis is that of cancer. In Pollitzer's case the lesions disappeared after a time, but the patient died later from what was supposed to be internal cancer. In my case a similar sequence of events probably occurred. Hodara reports a case in which, after the removal of a cancerous breast, the pigmentation, which had appeared two months after the appearance of the growth, almost disappeared, but six months later there was recrudescence, with considerable extension.

**Treatment.**—If the warty growths become inconvenient from their size—about the umbilicus, for instance—they may be removed with the knife, or, if too diffuse to be thus dealt with, by the application of salicylic acid. In a case reported by Bulkley in 1909, that of a girl of eleven, marked by irregular erythematous plaques of various sizes and shapes, the lesions remained as red patches if treated with alkaline baths and an emollient ointment, whereas if left untreated they would darken

and become dry and almost ichthyotic. The constitutional treatment must proceed on general principles. If there be positive evidence of abdominal cancer the case may pass into the domain of surgery.

MALCOLM MORRIS.

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# DISEASES OF THE SWEAT APPARATUS

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FUNCTIONAL DISEASES.—**Introduction.**—Although the functional disorders of the sweat glands have been known to physicians from the earliest times, and have been made, indeed, the subject of very special study, their structural diseases form a comparatively recent branch of pathological research. The main reasons for this delay have been well summarised by Pollitzer, who indicates "the obstacles which the location of the chief portion of the gland at the bottom of the cutis creates; the fact that the great number and close relation of the glands make it difficult to observe clinically the beginning of a disorder in a single gland; and, finally, the early involvement in most cases of the neighbouring cutis, which may entirely obscure the relation of the sweat gland to the pathological process." He further adds: "There is no reason to believe that the sweat glands are favoured with an exceptional immunity to the disorders to which all other glandular structures are subject." Our

knowledge would undoubtedly be greatly increased if biopsies, or the excision of portions of living tissue, were more frequently resorted to; but in a class of cases many of which are comparatively trivial the objections to such a procedure are obvious.

The dual function of the sweat glands, in that they secrete a certain amount of fat as well as of sweat, was demonstrated, in 1844, by Krause, and has been confirmed by the more recent researches of Kölliker, Meissner, and others, especially of Unna. Despite the opinion recently expressed by Lombardo that the unctuous substances contained in sweat are not true fats, but the results of decomposition of epidermic cells under the influence of fermentative bodies (enzymes or bacteria), we believe that the close relationship existing between sweat and sebaceous secretion is fully shewn by the coexistence in abundance of both sets of glands in many regions of the body (scalp, flexures, genital regions), and, mainly on clinical grounds, we endorse Duhring's opinion "that the two sets of glands act in concert, both in health and in disease, more commonly than is generally admitted by physiologists and pathologists" (*vide* also p. 684).

In many conditions, loosely denominated as "eczema," the primary and essential changes are seated in the sweat and sebaceous glands concurrently; and functional changes, chiefly in the direction of increased activity (sudorrhoea, seborrhoea), generally form a prelude to structural changes, especially those of an inflammatory nature. This interesting subject cannot, however, be further elaborated here.

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Hyperidrosis.—Syn.: *Idrosis; Hydrosis; Polidrosis; Sudorrhoea.*

**Definition.**—A functional disorder of the sweat glands resulting in excessive perspiration.

**Etiology.**—General sweating occurs in many constitutional diseases, and as the systemic vigour is increased the tendency to excessive sweating on exertion or otherwise as a rule diminishes. Pyrexia usually causes free perspiration not only while the temperature is raised but also for some time afterwards; a result due to persistent functional disturbance of the heat-regulating centre. The sweats characteristic of rheumatic fever and septicaemia are probably due to the factors responsible for these diseases. One of us has observed a most severe case of persistent hyperidrosis after sun-stroke. Obesity is also a frequent cause of it, and in these cases there is usually a hyperaemia of the cutaneous vessels. The association of flat foot with hyperidrosis of the soles is so frequent as to render their dependence upon one another indubitable. The moist palm of the habitual tippler is familiar to every one; and a similar con-

dition is common in neurotic women, in persons addicted to excessive tea or coffee drinking, or under prolonged courses of arsenic. The disorder may at times be congenital; and cases have been recorded which seem to shew that it may also be hereditary. Thus, Ollivier records the case of a patient who suffered from hyperidrosis in the area of distribution of the right inferior maxillary branch of the fifth nerve, and whose maternal grandfather, maternal aunt, and one sister were affected with the same complaint. Lobstein has recorded similar cases, and states that sometimes all the members of a family may be affected.

In diseases such as ichthyosis, in which considerable areas of the skin are practically functionless as regards the sweat, complementary hyperidrosis may be present in other areas, such as the palms of the hands, when they are free from disease. Emotional disturbance is a frequent cause of temporary hyperidrosis; and it has been said that organic lesions of the nervous system, and new growths more especially, may induce a more or less permanent increase of sweat secretion in certain areas. Thus, Bouveret records a case of gumma of the brain with unilateral hyperidrosis; and Adamkiewicz mentions a case of abscess of the brain with hyperidrosis of the opposite arm. The same author has also described the discovery of a glioma after death in a case in which there had been hyperidrosis. Organic lesions of the sympathetic system have also been said to produce the disease (*vide* Vol. VII. p. 495); and the excessive sweating associated with Graves' disease may perhaps be ascribed to functional disturbances of the same system.

The hyperidrosis which occurs in cases of peripheral neuritis is most easily explained by assuming that the lesion is chiefly of the inhibitory fibres of the sweat glands; thus, again, the sweats of pulmonary tuberculosis, chronic alcoholism, arsenicism, and plumbism may best be explained.

**Pathology.**—The classical experiment of Claude Bernard, demonstrating that paralysis of the sympathetic is followed by excessive sweating, is the starting-point of the experimental physiological study of the sweat glands. Clinical cases have since been recorded which seem to shew that lesions of the sympathetic causing paralysis may also induce functional activity of the sweat glands, as also may irritative lesions of other parts of the central nervous system. Weir Mitchell has described local hyperidrosis as a sequel of division of nerves by gunshot injuries. The local sweats which often accompany megrim or neuralgia probably own a similar origin. That sweating is brought about by nervous influence, and not by direct action on the secreting cells, is well shewn by the following experiment:—In a cat the sciatic nerve is divided on one side, and the animal is placed in a hot chamber; the sweat does not appear on the foot of which the nerve is cut, though the other feet are bathed in perspiration. Similarly, conditions producing dyspnoea do not cause sweating of the foot of which the nerves are cut, but profuse sweating of the foot of which the nerves are intact.

The secretion of sweat is not entirely dependent on dilatation of the

cutaneous vessels, or necessarily accompanied by it; in health, an actively perspiring skin is usually a flushed skin, but the vascular dilatation is a concurrent condition, not the cause of the secretion. When in the dog the peripheral end of a divided sciatic nerve is stimulated, a copious secretion of sweat is produced on the foot of the same side, although by excitation of the vasomotor nerves the vessels are generally constricted. On the other hand, atropine abolishes the secretory power of the sciatic, though leaving its vasomotor influence untouched; pilocarpine stimulates secretion by direct action on the sweat glands, or on their nerve fibres, as distinguished from any effect on the vessels. The dependence of the secretion of sweat upon nervous impulses is in direct contrast with the mechanism of excretion in the kidney. In the kidney, blood-flow is the chief factor; in the case of the sweat glands, although vascular dilatation may aid secretion, the nervous impulse to secretion is the essential part. We should bear in mind that the solids of the sweat are but accidental impurities of the watery vehicle which contains them, while the solids are the important part of the urine, the water being but the vehicle of their removal. In other words, urine is an excretion, sweat is a secretion, essentially necessary for the proper heat regulation of the body but apt to be secreted in abnormal amount when the innervation of the sweat glands is faulty.

**Symptoms.**—Sweating, either general or local, within normal limits is a physiological process. It is when sweating is excessive in proportion to the stimulus that it becomes pathological. Local sweating may be confined to certain regions, such as the armpits, palms, soles, interdigital spaces, and genital organs; or it may be limited to the area of distribution of a single nerve-root, or to a peripheral branch of a nerve—the fifth nerve, for instance—under some local excitement. Less frequently a limb may be affected, or the whole of one side of the body (Bichat, Roque); and such cases may be congenital (Vörner); although in cases of transverse lesion of the spinal cord the whole of the body below the level of the lesion may be thus affected. Bauer records an interesting case of a man, aged thirty-six, who suffered for fourteen years from crossed hemi-hyperidrosis affecting the right armpit and the left calf. Kaposi, on the other hand, reports a case of a boy suffering from kypho-skoliosis in which the hyperidrosis was located entirely above the level of the lesion. Hyperidrosis may be accompanied by hyperaemia, or by vaso-constriction of the cutaneous vessels; and certainly it is not always accompanied by a rise of temperature of the part affected. The cold sweats of certain emotional states, and those frequently present just before death, may be contrasted with the hyperidrosis of moist covered parts, such as the axillae, where, as Aubert has shewn, the temperature may be raised half a degree. General sweating may be so excessive as even to appear to be the cause of death (Myrtle). A case of profuse sweating some hours after death has even been recorded (Cones).

In hyperidrosis the part affected is damp, moist, and clammy; and in more marked cases the sweat may flow off in little streams, and in

extreme cases the gloves or even the boots may become thoroughly soaked. If the sweating continue, the epidermis, continually saturated with moisture, becomes wrinkled and assumes a whitish tint; and its superficial layers become so softened as to be readily detached by rubbing. This condition is generally seen in the palms and soles, and between the toes; in the case of the scalp and armpit a more or less well-marked hyperaemia of the skin is present, and the horny layer of the epidermis becomes partially detached.

Much discomfort may be caused by hyperidrosis of the hands and feet; the latter becoming sodden and tender, or even eczematous, whilst both palms and soles may become markedly hyperkeratotic. The increase of the horny layers may be often, in the first instance, distinctly localised round the sweat pores. This association of hyperidrosis and hyperkeratosis of the palms and soles is a common and characteristic phenomenon of chronic arsenical intoxication.

**Course.**—Hyperidrosis, once established at a certain pitch of intensity, may remain almost stationary, shewing but slight changes of importance, though varying from time to time in amount as the causes increase or diminish. Spontaneous cure is not very often observed; nor is local hyperidrosis, as a rule, affected by the intervention of constitutional disease or by its cure. In regions like the genitals, where adjacent skin surfaces are in contact, it frequently passes into "eczema" or "intertrigo."

Hyperidrosis is frequently associated with other diseases of the sweat glands, for example sudamina, miliaria, prickly heat, hidrocystoma, and granulosis rubra nasi, whilst its clinical association with pompholyx and acute lichen planus is of extreme interest and some little obscurity.

**Prognosis.**—It is seldom possible to form an accurate prognosis in a case of hyperidrosis, for the disease, when apparently improving under treatment, may recur; or it may disappear spontaneously when we least expect such a result.

**Treatment.**—Before proceeding to any local treatment, the general condition must be carefully investigated and any abnormalities rectified, so far as is possible, by appropriate internal and general treatment. Constitutional diseases—such as pulmonary tuberculosis, alcoholism, or obesity—must be treated on the usual lines; and it will be found, as a rule, that improvement in the general health will be accompanied by diminished tendency to excessive sweating. Anaemia, neurasthenia, malaria, or general "want of tone" must be treated by appropriate remedies. In cases of flat foot, wearing properly-made boots frequently and immediately gives rise to alleviation of the distressing symptom. The local as well as the general condition may be further improved by the frequent use of the cold bath and cold douche, either with or without a preceding warm bath, according to the vigour of the patient. Such hydrotherapeutic methods, though directed primarily to the cutaneous vasomotors, also have a direct, if more or less temporary, effect on the sweat glands. We have seen that certain drugs act directly upon the

sweat glands through the nervous system; and as by means of pilocarpine we can induce a copious secretion of sweat, so by the administration of belladonna or atropine we may inhibit the secretion completely or, more frequently, partially. Belladonna may be given as the extract or tincture, or atropine hypodermically in doses of $\frac{1}{100}$ gr. gradually increased. The familiar effects of an overdose of these drugs must be constantly borne in mind, and their administration curtailed or stopped on the appearance of symptoms of intoxication; indeed, at best, their good effect is often but temporary. Acetate of thallium is probably the most active anti-sudorific drug known, but its action in producing baldness has led to its general discontinuance in practice.

Many other drugs have been recommended, and from their number their value may perhaps be estimated. Ergot, aconite, veratrin, agaracin, picrotoxin, and many others have been prescribed; but Crocker's remedy is probably the best, and certainly does give good results in some cases—this is a dram of precipitated sulphur administered in milk twice a day; if it produce too much purging, he combines it with pulvis cretae aromaticus.

External treatment should, however, always be combined with the constitutional; dusting powders and astringents, applied after the part has been wiped thoroughly dry, are often of great service. The use of hydrotherapeutic methods has already been mentioned, and attention may also be drawn to electric baths and the use of the constant current.

Baths medicated with perchloride of mercury, hydrochloric or tannic acids, alum, turpentine, or naphthol, may be tried in suitable cases. After the bath the part must be very carefully dried, and then powdered over. The best dusting powder is one containing salicylic and boracic acids with alum and starch, the proportions of which must be varied according to the chronicity and extent of disease; as a rule about 15 grains of salicylic acid and 30 grains of boracic acid to the ounce make a suitable strength. Chloral hydrate, in quantities up to a dram to the ounce, may be added to the starch powder; or powders of tannoform, salicylic acid, talc, bismuth, or lycopodium may be employed. The analysis of a secret remedy used with success in the Tropics revealed the following composition: alum, tannic acid, gallic acid, of each 15 parts; terra silicea, 50 parts; tragacanth, 5 parts. This powder, made into a thick paste with a sufficiency of water, acted with great promptitude and success for a week at a time in a case of extreme hyperidrosis of the palms under the care of one of us.

G. H. Fox has advised a lotion containing 1 per cent of quinine in alcohol; and other physicians have recommended alcoholic solutions containing 2 per cent of tannin or alum.

When these methods of treatment are not successful, and the disease is confined to the feet, where the secretion often becomes fetid, the following method of Hebra may be adopted: the stinking stockings and boots, which may have been impregnated with sweat for weeks or months, are to be destroyed; then the foot is to be well washed and dried, and a

small quantity of simple diachylon plaster spread on linen applied to it; pledgets of lint covered with this ointment are also to be introduced between the toes, to prevent contact. An ordinary sock may now be drawn over the foot, and over this a new shoe, which must be light, and must not cover the dorsum of the foot. After twelve hours the dressing is removed, the foot rubbed dry with a cloth, and dusted with one of the powders previously mentioned. This treatment is to be continued twice a day for eight or nine days, the patient going to his business meanwhile; at the end of this time the dressing is finally removed. In a few days' time the superficial epidermis begins to peel off the areas affected with the disease, and when this layer has become completely detached, the foot may for the first time be washed. The hyperidrosis will be cured within two or three weeks after the first application of the dressing, and the relief will last for some time, or may even be permanent; but generally a repetition of the treatment is necessary. A modification of this treatment (Duffin) is to strap the feet with lead plaster daily for a fortnight; the result is much the same as in Hebra's method, the superficial layers peel off in considerable strips and leave the deeper layers quite healthy. Instead of lead plaster, ointments composed of zinc, ichthyol, salicylic acid, or resorcin may be substituted; but they must be applied continuously for some days. In treating hyperidrosis of the feet, a distinction must be drawn between feet that are cold and sweating, and feet that are warm and sweating. When the feet are cold, methods to induce hyperaemia are to be adopted; thus they may be bathed at night with solutions of perchloride of mercury (0·5 per cent), of soda (5 per cent), of permanganate of potassium (3 per cent), of silver nitrate (10 per cent), or in water containing hydrochloric or acetic acid. Should the patient be able to stand it, a further stimulating ointment may be applied during the night; or the foot may be painted with a 3 per cent solution of liq. ferri perchloridi (Legoux). Trichloracetic acid may be substituted as a paint, or, provided there be no cracks in the epidermis, the method adopted in the German army, of painting with a 5 per cent chromic acid solution once a week. Kobert, however, has seen perforation of the nasal septum and also nephritis follow the application of chromic acid. Should the patient be unable to stand such heroic methods, a weak ointment containing 5 per cent of ichthyol may be applied during the night after the bath; or, in more acute inflammation, a plaster-mull of zinc and ichthyol. In the morning the feet are to be cleansed, and an alcoholic solution applied containing 3 per cent of naphthol, or 5 per cent of salicylic acid. After this has dried, the feet and the inside of the socks are to be dusted with one of the powders previously mentioned, special attention being paid to the interdigital clefts.

In the case of feet that are warm, a less energetic line of treatment may be adopted. Warm baths at night are prescribed with the addition of a little alum or borax, followed by the application of some such ointment as the following: ℞ Ichthyol gr. v, terebinthinae ℥ x, ung.

diachyli Hebrae ad ℥j. The consequent local anaemia and inhibition of secretion after several repetitions become more or less permanent; especially if a paint containing 2 per cent of resorcin be applied during the day. A powder of tannoform is extremely useful to apply to the feet, and to dust inside the socks when the patient is moving about.

In all cases large and comfortable boots are to be worn and woollen stockings or socks, frequently changed.

A similar distinction is to be drawn between the hyperidrosis of cold and warm hands. The former may be treated with baths containing camphor, acetic acid, or other substances which induce hyperaemia, followed by the application of an ointment containing half a dram of camphor and a dram of ichthyol to the ounce of zinc ointment. During the daytime Kaposi's alcoholic solution may be employed: ℞ Naphthol ℥j, eau de Cologne ℥iij, spirit. vin. gall. ℥ij. Ft. lotio.

Warm sweating hands are best treated with weak alkaline baths, such as 5 per cent solution of borax; or by infusions of oak bark combined with formalin soap, the lather of which is allowed to dry on. Weak ichthyol powders may be dusted on during the day.

Numerous soaps have been recommended for hyperidrosis, especially those containing zinc and formalin. Buzzi strongly recommends a soap with 10 per cent of camphor, and for hyperidrosis pedum a 10 per cent creolin soap.

An excellent temporary remedy for sweating armpits—sometimes a very irksome complaint in women—is the application of a sponge wrung out of water as hot as can be borne, followed by the use of a 1 to 2 per cent solution of quinine in eau de Cologne, or of a 3 per cent salicylic acid powder. By far the most satisfactory treatment, however, for local hyperidrosis, wherever situate, is by the application of *x*-rays. The dose should be carefully measured, a full Sabouraud-Noiré pastille dose being given at one sitting and repeated, if necessary, after intervals of not less than one month. The sweating diminishes in a few weeks after the first application, and after two or more the cure is usually complete and apparently permanent.

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Anidrosis.—**Definition.**—A functional disturbance of the sweat glands giving rise to a deficient secretion of sweat.

The amounts of sweat normally secreted by different persons in

similar circumstances vary greatly. Deficient secretion of sweat may be local or general, complete or partial; symptomatic, as in pyrexia, albuminuria, prurigo, and diabetes; or congenital, as in ichthyosis. The condition again may be diffuse, as in tuberculosis, carcinoma, and diabetes mellitus; or it may occur only in areas in which the sweat glands have been injured, or to which the nerve supply is abnormal. In certain skin diseases, such as eczema, psoriasis, sclerodermia (diffuse or localised), and anaesthetic leprosy, the secretion of sweat over the diseased area is very often deficient, or even absent; and there is every reason to think that the disordered innervation, which seems to be a factor in the causation of these skin affections, gives rise to the anidrosis also.

The atrophy of the skin of old age is usually accompanied by a diminished secretion of sweat. In a dirty skin the openings of the sweat ducts are blocked, the secretion is reabsorbed by the lymph-stream, and possibly atrophy of the sweat glands ensues. Cessation or diminution of sweat may in certain circumstances be but temporary; whether temporary or permanent, a diminution of excretion by the skin must be compensated by an increase of activity of the kidneys or lungs, if toxic substances are not to accumulate in the organism.

Anidrosis at times accompanies megrim, and then usually affects the temporal region. It may also occur in cases of sympathetic paralysis, associated with myosis and vascular dilatation (Möbius). Cases of anidrosis have been recorded in infantile paralysis and in transverse myelitis; the secretion of sweat returns with the electric reactions of the limbs. Improvement or cure of any skin disease which gives rise to anidrosis is accompanied by renewal of sweat secretion in the affected area. Unna states that the parakeratoses in general are accompanied by a diminished secretion of sweat; and Eulenburg has recorded the same fact in erythromelalgia.

**Causation.**—Anidrosis is sometimes congenital, as in ichthyosis; but, as a rule, it is acquired, and is then frequently a symptom occurring in the course of some other disease.

**Pathology.**—The disorder, when occurring in the course of pyrexia, has been ascribed by Unna to an occlusion of the sweat duct by swelling of the epidermic structures, especially of the stratum lucidum. That occlusion of sweat ducts, if sufficiently general, will bring about anidrosis is obvious; but Unna's suggestion does not seem at present to have met with general acceptance, the anidrosis being attributed rather to disordered innervation of the sweat glands accompanying the disordered thermotaxis. As has been pointed out under the head of hyperidrosis, the secretion of sweat is not entirely dependent on dilatation of the cutaneous vessels; moreover, such dilatation may be accompanied by anidrosis. No doubt this condition may be due to a trophic disturbance of the nerves of any cutaneous area.

**Treatment.**—Any coincident disease, and especially any skin disease, must be treated primarily. The secretion of sweat may then be stimulated by the application of warmth and vapour to the skin; for instance, by

"Turkish" or "Russian" baths, and the ingestion of hot drinks. Nitrate of pilocarpine may also be given in doses of $\frac{1}{6}$ gr. hypodermically; or jaborandi may be given by the mouth, adequate precautions being observed against "catching cold." This treatment, if persistently carried out, is often of great service in the anidrosis of true prurigo.

The skin may be stimulated by mustard powder or like irritating substances; and recourse may also be had to the constant and faradic currents. In some cases massage, applied regularly every morning, is of great service.

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BROMIDROSIS (*βρῶμος*, a stench; *ἱδρώς*, sweat).—SYN.: *Osmidrosis.*

**Definition.**—Offensive odour of the sweat, due to changes in its composition either before or after secretion.

**Pathology.**—It has been shewn that, if the shoes and stockings be removed from a patient suffering with bromidrosis, if his feet be washed thoroughly, and he be kept in bed for a few days, the feet have a far less offensive smell than the shoes and stockings. The secretions of the feet are probably not offensive in themselves, the intolerable smell arising from the decomposition of their fatty ingredients under the influence of the *Bacterium fetidum* of Thin. Bacteria of various kinds may be found in the decomposing sweat, and horny and fatty materials which accumulate on the surface of the skin in these cases; and several of them probably assist in the decomposition, caproic, caprylic, and other fatty acids being formed and exhaling their characteristic fetors.

**Symptoms.**—The odour of the sweat is often unpleasant, especially if the clothes are allowed to become saturated with it; in certain circumstances the sweat of certain parts of the body becomes positively and obtrusively offensive. It is in the feet especially that this odour is most penetrating, and as a rule the flat-footed and those who are most continuously on foot suffer most. In young persons liable to hyperidrosis the sweat is especially apt to become offensive; thus maid-servants, waiters, soldiers, postmen, and the like, may be rendered unfit to earn their livelihood. Hyperidrosis is almost invariably present also, soaking the boots and stockings with a stinking matter; and the feet exhale a rancid, sickening stench. The feet also become tender and sodden; walking is extremely painful, as the skin, especially of the soles and sides of the feet, becomes inflamed and macerated, and may be the seat of a vesicular or bullous eruption.

It is, of course, evident that the less frequently the coverings of the feet are changed, and the more impermeable they are to moisture, the more saturated they will be with the offensive secretion, and the more prone the feet will be to eruptions of various kinds. Bromidrosis also affects the armpits, pubic region, perineum, and groins; but the smell

here is more "fusty," and not so overpowering as that of the feet. In the former regions intertrigo is a frequent complication.

True bromidrosis is quite distinct from the peculiar odours of the sweat in negroes, and from that in the various diseases of which such odours are said to be pathognomonic. Thus, the acid smell of rheumatic fever is very familiar; in scarlet fever the sweat is said to smell like new bread; in miliary fever like decomposing straw; in small-pox like a menagerie; indeed, the older physicians trusted largely to their recognition of these peculiar characters in the diagnosis of disease. Emotion may certainly give rise to a peculiar odour of the sweat; and in certain nervous disorders Monin and Hammond have recognised agreeable odours of the sweat, as of violets or pine-apple.

**Treatment.**—Complete cleanliness is before all things essential. The coverings of the feet, or of the armpits, should be of absorbent material and be frequently changed. Baths, containing a small amount of alum or borax, may be used night and morning for the affected part; and during the day an ointment or dusting powder containing boracic or salicylic acid. In the German army a 2 per cent ointment of salicylic acid is largely used. A powder containing 1 in 20 of resorcin may be used instead; or the following: ℞ Sod. salicyl. gr. xv., bismuthi subnitr. gr. xxx., pot. permang. ʒiss., and pulv. cret. prep. ad ʒj. Vinogradoff of Kazan claims good results from a 6 per cent aqueous solution of chloride of zinc. This is applied after a tepid bath at bedtime and the feet are then dried.

As we have said in the preceding section, painting with a 5 per cent chromic acid solution is a method adopted in the Prussian army with good results, since it is stated to be successful in over 90 per cent of cases. Thin recommended saturating the stockings and cork soles in a jar containing boric acid for hours, thus rendering them inimical to the *B. fetidum*. Antiseptics, such as mercury in weak alcoholic solutions, may also be employed, and other measures already described under hyperidrosis; but in our experience the most useful lotion is one containing formalin in the strength of 1-5 per cent, after which boric acid powder should be applied to the affected parts. The stockings and boots should always be freely dredged with boric acid powder. As in the case of simple hyperidrosis the *x*-rays are of extreme value. Internal treatment is not successful.

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Chromidrosis (χρῶμα, colour; ἱδρώς, sweat).—Syn.: *Pityriasis nigricans; Seborrhoea nigricans.*

**Definition.**—Secretion of pigmented sebum or sweat.

**Historical.**—Coloured sweating may occur in most parts of the body, but the affection is always a rare one, although the somewhat mysterious character of the disease has given rise to an extensive literature. The name was first given to the disorder by Le Roy de Méricourt in 1864; but cases had been published previously, the first recorded being by Yonge in 1709. Lecat (1765) and Billard had observed examples of pigmented sweating; and Teevan had published a singular case of a black secretion from the skin of the forehead and upper part of the face. Bousquet, Neligan, and Erasmus Wilson had also recorded cases before de Méricourt, to whom, however, we owe the first complete analytical examination.

**Etiology.**—The great majority of cases occur in women, probably as much as 85 per cent. Most of the patients suffer from chronic and well-marked constipation, and many also from menstrual disorders. But almost all agree in presenting the stigmata of hysteria, or they are at any rate of extremely neurotic habit, emotional and excitable, and an easy prey to anxiety, or to the conditions which make for a morbid desire for sympathy.

**Pathology.**—Microscopical examination has clearly shown that chromidrosis has not always its origin in the sweat glands; indeed, Radcliffe Crocker and other authors state that the affection may likewise be due to a disturbance of the sebaceous glands, which gives rise to a secretion of pigmented sebum. The material is certainly in some cases largely composed of fat, is soluble in ether, spirit of chloroform and glycerin, and not in water; and contains amorphous granules, usually of an indigo colour. These granules do not, however, give the usual chemical reactions of indigo; and there is much doubt about their chemical composition. It has been supposed that, even if the pigment of chromidrosis be not indigo, it is some combination of indigo with an organic substance, the indigo being originally derived from the indol of the faeces. We have said that many of these patients are the subjects of constipation, and it is well known that long-continued constipation, from whatever cause arising, is apt to be associated with considerable quantities of indican in the urine. Practically nothing is known about the pigments found in cyanidrosis, or in yellow and pink sweating.

**Symptoms.**—Though the disorder giving rise to coloured sweat sometimes concerns the sweat glands only, in several cases the sebaceous glands also have been primarily affected, and the sweat glands little if at all. In the former class the coloration is of rapid, in the latter of slow formation (Crocker).

Chromidrosis most frequently affects the face, and especially the eyelids, cheeks, and forehead. The chest and abdomen are not often affected, and it is extremely exceptional on the hands and feet. Occasionally the sweat of the armpits, groins, and popliteal spaces is pigmented. The colour is usually dark brown or black; but it may also have a shade of blue or indigo, or be even a somewhat light blue (cyanidrosis). Green, red, and yellow sweats have also been recorded; and

the chromidrosis may be accompanied by pigmentation of other secretions or excretions. Thus, Macker had under his observation a girl of nineteen with an indigo pigmentation of the orbits and forehead, accompanied at times by a blue coloration of the saliva. Teevan, Billard, and Neligan found black pigment in the urine, faeces, and vomit, besides its presence in the sweat. Pigmentation of the urine and milk has, moreover, been observed unassociated with chromidrosis. Macker's case was also interesting on account of some pigmentation of the hands, and a similar case has been recorded by Germain. A very rare yellow pigmentation of the sweat of the hands, in a married woman of twenty-four, was under the observation of Barrié; and the case was still more unusual in that the chromidrosis alternated in the two hands; it never affected both at the same time. The disorder was present only during the two days of menstruation, and no pigmentation was to be seen on the rest of the body. Yellow chromidrosis has also been observed by de Moerloose and by Purdon; Tison had 3 cases among the servants of the same house, 1 being a boy of sixteen, and the other 2 adults over thirty years of age.

FIG. 140.—Black chromidrosis of the face in a girl aged 18¾ years. The case was published by Dr. Colcott Fox (*Trans. Clin. Soc.*, Lond. 1881, xiv. 211). It was referred to a committee for investigation, and the committee (*Trans. Clin. Soc.*, Loud., 1882, xv. 255) was convinced that it was a genuine chromidrosis. (From a water-colour drawing kindly lent by Dr. Colcott Fox.)

A large number of cases of peacock-blue discoloration of the interdigital skin of the feet have been reported in this country; but Dr. A. J. Hall, of Sheffield, conclusively proved that the condition is due to decomposition of a cheap black dye substance in the stockings by the acid sweat.

De Méricourt brought before the Académie de Médecine in 1884 a case of pink chromidrosis in a lad of twelve; and Speranza saw green chromidrosis of the feet and back supervene during an attack of rheumatic fever in a cachectic girl of fourteen. A case of unilateral yellow chromidrosis in a man has been recorded by White of Boston; and one of blue sweating of one side of the scrotum by Conradi. In some cases it is stated that the colour of the sweat changed while the patient was

under medical supervision. But, without discussing other remarkable cases, such as that of Mollenbroeck, in which the secretion was stated to have the colour and appearance of honey, it is necessary to utter a word of warning against deception, which is sometimes practised with extreme ingenuity. Some undoubted cases have, however, been observed in this country, and have stood most careful investigation. Thus, one has been recorded by Dr. Colcott Fox, and two more by Radcliffe Crocker; but there is reason to believe that from time to time cases have been published as examples of chromidrosis which were not entirely worthy of credence. It is further stated that in some even of the largest dermatological clinics abroad not a single case has ever been recorded. Finally, it is only necessary to repeat that the majority of cases have been observed in hysterical women, suffering in many instances from menstrual disorder.

**Course.**—Cases of chromidrosis usually get well rapidly under treatment, but the disorder is very prone to recur. A return of menstrual troubles, or even of the normal menstrual period, very frequently causes a recurrence of the affection; and it always tends to reappear, or if present, to undergo an exacerbation, with the onset of any great emotion or any nervous disturbance. The cases which supervene on some constitutional disease, such as rheumatic fever (Speranza), tend to recovery with the general symptoms.

**Treatment.**—Attention must be paid to the general health, and any constipation or menstrual disorder energetically treated. The local condition must be met by complete cleanliness, and the application of a lotion containing ether and spirit, combined with boracic acid or naphthol.

**Sweats coloured by Drugs.**—In addition to cases of true or idiopathic chromidrosis, cases occur from time to time which can be traced to the effect of some drug, whether taken internally or applied locally; or to the presence of some microbe.

*Pink, blue, and green sweats* have been ascribed at various times to the use of different drugs. Thus, Temple had under observation a man of sixty, whose silvery hair and beard became light pink after taking about eight grains of iodide of potassium three times a day for a week. His linen became stained, and if his handkerchief was used to wipe off the sweat, it also was discoloured pink. Withholding the iodide caused the colour to disappear gradually, but it returned when the medicine was resumed. Kollman, quoted by Crocker, has recorded a case of blue chromidrosis in a patient taking considerable quantities of iron; and iron sulphate was found in the sweat.

Green sweat is frequently observed among workers in copper, the dust or fumes entering the lungs, being absorbed by the skin, or ingested with the food. The linen becomes freely stained with the coloured sweat, and even the hair may be discoloured. Hyde observed a case due to the application of a copper electrode to the abraded skin.

Red sweating is a common disorder and is in some cases "idiopathic," as in one recorded by Dubreuilh; but the majority are undoubtedly due

to the presence of micro-organisms. Such cases are not true examples of chromidrosis, but are due to a growth of the *B. prodigiosus* on the hairs of a moist warm region, such as the armpit. This locality affords an excellent nidus, especially if it is not spoilt by the too free use of soap and water; and Babesiu, Babes, and others have discovered zoogloea-like masses growing upon the axillary hairs and giving them a well-marked red colour. The roots of the hairs are not involved, but the zoogloea masses become detached, and may be washed off in the sweat if it be at all profuse.

**Haematidrosis** is the name applied to the escape of blood from the mouths of the cutaneous glands, whether sudoriparous or sebaceous. In most cases it is due to a haemorrhagic exudation into the lumen of the gland and into its duct, the extravasated blood being carried to the surface of the skin along with the secretion of the gland, and making its appearance at its cutaneous orifice. Hebra has, however, himself seen a jet of blood escape from the uninjured dorsal surface of the hand in a young man, the jet corresponding in size to the duct of a sweat gland, and rising an appreciable distance above the surface of the skin. Neither in this patient, nor in others who have come under observation, has there been any reason to suspect haemophilia, though the affection has some resemblance to purpura. The similar cases recorded by Finol and Sir Erasmus Wilson were cases of haemorrhage from the skin. In some instances the haemorrhage may be a vicarious menstruation; but it occurs so frequently in hysterical young women that it must be regarded as one of the hysterical stigmata. This view is taken by Parrot, who points out the coincidence of other hysterical phenomena with this affection; and it is confirmed by the experience of one of us in a striking case. It seems probable that many of the cases which have been recorded were impostures; nevertheless genuine cases do occur, even in hysterical subjects. It is necessary, however, to point out that cases of cutaneous haemorrhage unconnected with the orifices of the sweat or sebaceous glands are in no sense examples of haematidrosis.

*Treatment* must be directed to the cause of the haemorrhages; as in purpura, for example.

**Phosphorescent sweat** is extremely rare, though cases are said to have occurred after the ingestion of phosphorus in fish or as medicine, or in advanced cases of tuberculosis or cancer. This phosphorescence may in some cases become more apparent after violent muscular exertion, when even the body linen is said to become luminous. The phenomenon is probably due to phosphorescent bacteria, present also in the urine and other secretions, numerous varieties of which have been described.

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URIDROSIS.—A minute amount of urea is normally present in sweat. In certain circumstances it may exist in sufficient quantity to impart a urinous odour to the body, or even to appear on it as a crystalline deposit like hoar-frost. The latter condition is reported by Frazer-Nash (quoted by Crocker) to be of no infrequent occurrence in India; and by him it is attributed to a diet of milk, fruit, coarse bread, and water. A urinous odour of the sweat is common in uraemia; it may arise in cholera; and, immediately before death, in many diseases in which the kidneys are intact.

HYPERTROPHY AND ATROPHY OF THE SWEAT GLANDS.—As these conditions are of little practical clinical importance their consideration here will be very brief.

**Hypertrophy** of the sweat glands (Spiradenoma, Unna) occurs either as a congenital or acquired change.

**Congenital hypertrophy** may be part of a general excessive development, but is more frequently found in connexion with localised hypertrophies of the epithelium and corium, such as occur in ichthyosis, soft warts, and especially in those forms of linear and other naevi which are considered under the title of Hystrix (*vide* p. 23).

**Acquired hypertrophy** occurs in various circumstances, for instance, from increased functional activity, as in chronic tuberculous diseases and articular rheumatism; under any chemical, mechanical, or thermic irritation; as the result of many chronic affections of the skin—probably as a consequence of irritation—such as prurigo, chronic eczema, elephantiasis, and lupus.

As long as the function of the glands remains unaltered, and the epithelium conforms to its type, these conditions may be pathologically considered as true hypertrophies. Should secretion, however, be arrested, or offshoots be thrown out from the primary convoluted tubes, or other such changes occur, the growths must be regarded as adenomas; and

further changes resulting in various carcinomatous conditions are described and are probably not infrequent. (For further information on this obscure subject reference may be made to an extremely elaborate article by Unna, who discriminates spiradenoma (adenoma of the coil gland) from syringadenoma of the duct of the coil gland.)

*Clinical Course.*—The fate of hypertrophied sweat glands varies as the causes. Congenital cases usually persist unaltered for years, or may, according to some authors, become the starting-point of carcinoma.

For Hidradenoma see p. 582.

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Hidrocystoma (ἱδρώς, sweat; κύστις, a bladder or bleb).—Syn.: *Hydrocystoma.* **Definition.**—A cystic affection of the sweat glands and their excretory ducts, giving rise to the formation of spurious vesicles, always localised upon the face.

**Historical.**—This comparatively rare but interesting affection was first described by Robinson of New York in a paper read before the Dermatological Society of America in 1884; in a subsequent paper he added an account of its morbid anatomy. The same affection has been described by Jackson under the designation of "Dysidrosis of the Face," a title which has been adopted by Rosenthal, Hallopeau, and Crocker. It is, however, inappropriate and misleading, inasmuch as the condition varies widely from the dysidrosis of Tilbury Fox (cheiro-pompholyx of Hutchinson), and Robinson's original name is therefore maintained. Dr. Jamieson has recorded examples, with microscopical examinations; cases have also been reported by Sir J. Hutchinson, Hyde, Adam, and others.

**Etiology.**—The disease is comparatively common in New York, Robinson having observed from thirty to forty cases; and apparently in Glasgow also, where Dr. Adam has seen nine cases, three of them in men; in England and on the continent of Europe it is much rarer. It almost always occurs in women who are middle-aged, or who have passed this period. As a rule they are washerwomen, or are employed in work which exposes them to a warm and moist atmosphere which causes sweating of the face. Examples are infrequent among the well-to-do classes. Sir J. Hutchinson describes sweat cysts in connexion with xanthoma, and always confined to the eyelids, which he considers of the same nature as hidrocystoma. The recurrence of the menstrual period is sometimes associated with an exacerbation of the disorder (Hallopeau), and it is invariably worse in the summer, improving—if not altogether disappearing—during the winter months. Thibierge, who records a case in a man, suggests that the disease is of nervous origin; a view which receives cogent support from the reports of the cases associated with unilateral sweating and neuralgia.

**Pathology.**—The vesicles result from a dilatation of the ducts of sweat glands, generally supposed to be due to obstruction of the ducts at a point peripheral to or nearer to the surface than the cyst. The lumen of the tube becomes dilated, and the epithelial cells lining it are compressed against the basement membrane by a granular fluid resembling

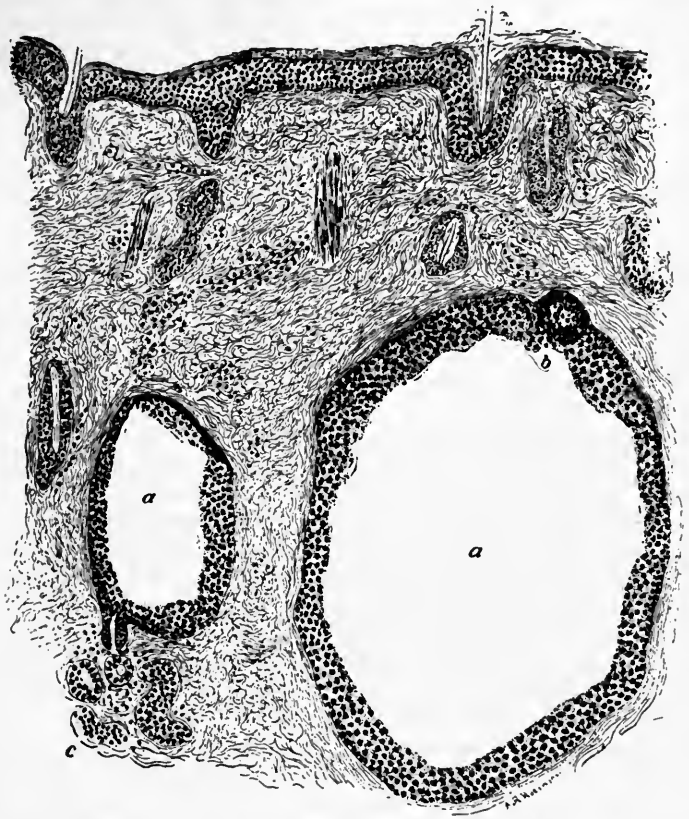


FIG. 141.—Hidrocystoma. Sections of a large and of a small cyst. In the smaller lesion the duct enters at the base of the vesicle. In the larger one the duct leaves at the upper end. The vesicles arise from a cystic dilatation of the excretory sweat duct lying within the corium.

(*a*) Large and small cysts; (*b*) excretory sweat duct at place of obstruction; (*c*) coil of sweat gland. (Reproduced by kind permission of Dr. A. R. Robinson of New York, from a drawing published in his monograph.)

that found in normal glands. Sections passing through a cyst shew, in some parts of the specimen, glands containing the granular material inside the lumen of the duct. The obstruction is found to occur always at a point within the corium not far distant from the subcutaneous tissue, and no abnormal changes can be found in the epidermis or sebaceous glands. The cause of the obstruction is not very evident, but the anatomical changes point to a hyperplasia of the cells lining the duct, so that the

channel becomes diminished and finally disappears. It is argued that the dilatation below the obstruction is not a passive one, since the entire cyst-wall becomes lined with an epithelium which must be derived from proliferation of the duct epithelium. Such an argument is not perhaps quite conclusive, especially if we examine the section of a retention cyst; but at any rate it would be remarkable that, if such were the case, the obstruction should not occur where the elasticity of the surrounding tissues is least and the channel narrowest; that is to say, where the duct passes through the epidermis.

Darier, from the examination of a case under Thibierge in 1893, and exhibited in 1899 by Déhu, is of opinion that hidrocystoma, though a dilatation of the sweat duct, is of the nature of a congenital growth, a cystic adenoma, and that it has nothing in common with pompholyx and sudamina. In the case referred to, the sweat cysts were associated clinically and histologically with soft moles, and Darier states that multiple "naevi" are frequently present in these cases. Déhu said, when exhibiting this case, that "in place of regarding, with most English authors, the lesions of hidrocystoma as cystic dilatations by obliteration of the sweat ducts," it seemed probable that the condition was one of "real epithelial neoplasms having their origin in a congenital malformation of the epidermis." Most writers, on the other hand, see a causal relationship between the hyperidrosis, which is a constant feature, and the cystic formation. Lebel thinks that the occasional formation of cysts in granulosis rubra nasi throws light upon their method of formation in hidrocystoma. The foci of inflammatory cells around the sweat ducts, which have been seen in hidrocystoma and regarded as of secondary nature, are, he thinks, probably the cause of the pressure on the duct, and so of obstruction and dilatation. Schidachi, working in Jadassohn's clinic, has recently (1907) produced cystic dilatation of the sweat ducts in the paws of a cat by making an incision parallel to the surface of the integument. The cystic dilatation occurred in the peripheral part of the duct, and the gland and portion of the duct below the incision remained little, or not at all, altered. Schidachi contests Darier's hypothesis that the cystic formation is a congenital growth. He thinks that even the hypothesis that the peripheral portion of the canal is congenitally absent is, when one considers the clinical pathogenesis of the affection, less likely than an extra-uterine destruction. Dr. James Adam, whose observations have already been referred to, suggests that the cysts arise from hypertrophy of the secreting part of the sweat glands, without compensatory means, in the excretory part, for getting rid of the excess of secretion.

**Symptoms.**—The lesions invariably appear on the face, and when present in small numbers are discrete, but they may attain a very considerable number, when, of course, they are nearer together; but it is rare to find them crowded closely. They occur on the forehead, nose, checks, around the orbits, and sometimes on the lips and chin. They occasionally attack the neck or lower jaw, but are never found upon the

rest of the body. Sir J. Hutchinson and Dr. Jamieson have described cases in which the affection was unilateral; and the latter observer noticed in his case that sweating was much more free upon the side of the lesion; a point also observed in one case by Sir J. Hutchinson, in which the condition was associated with violent headaches and neuralgia of the tongue on the same side. The lesions in the first instance are deep-seated, and of a whitish colour, closely resembling boiled sago-grains, but subsequently they become clear and vesicular; when larger they assume a bluish tint, most marked at the periphery. In the case of the larger lesions slight hyperaemia may be observed at the periphery, but as a rule there are no signs of inflammatory disturbance. In size they vary from that of a pin-head to that of a pea, and in shape they are round or ovoid. The vesicles contain a clear, pellucid fluid, which is slightly acid in reaction, and never turns red litmus blue. Subjective symptoms are usually absent, but slight itching or smarting may be present. The contents dry up without rupture after an existence of one or more weeks; the desiccated contents, appearing whitish, thus assume a somewhat close resemblance to milium. The area of the eruption then reassumes its usual appearance; or, if the lesions have persisted longer than usual, a slight temporary pigmentation may be left.

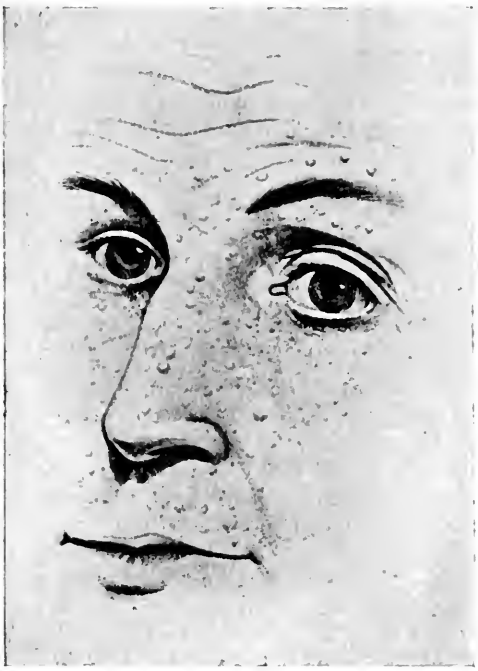

FIG. 142.—Hidrocystoma. From the coloured plate published by Robinson of New York. (By kind permission of Dr. A. R. Robinson.)

The **diagnosis** is always obvious to any one familiar with the disease. The lesions might perhaps be mistaken for those of eczema, adenoma of the sebaceous and sweat glands, granulosis rubra nasi (p. 652), localised lymphangioma, milium, colloid milium, sudamina, or pemphigus of the face; but they may be readily distinguished by their exclusive distribution on the face, their long duration, their annual exacerbations, their consistence and general appearance, and their clinical history.

**Prognosis.**—The eruption tends to disappear spontaneously at the approach of winter, but it recurs in summer if the patient be still

exposed to its causes. The disease may persist to an advanced age.

**Treatment.** — The vesicles should be punctured, the contents expressed, and an antiseptic lotion applied freely night and morning. In some cases the galvano-cautery may be employed. A soap containing camphor and Peru balsam is accredited with good results; and dusting powders containing boric acid, sulphur, kieselguhr, dermatol, and starch are all useful. Other means for combating local hyperidrosis should also be employed. Such occupations as are known to induce the eruption must, if possible, be abandoned.

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GRANULOSIS RUBRA NASI (Jadassohn). — **Definition.** — An affection of childhood characterised by persistent hyperidrosis of the skin covering the cartilaginous portion of the nose, associated with a diffuse redness of this part, inflammatory micro-papules at the mouths of the sweat ducts, and, occasionally, small cystic formations.

**Historical.**—Two examples of this curious affection were exhibited by one of us (J. J. P.) in 1894 at a meeting of the Dermatological Society of London, with the provisional diagnosis of hidrocystoma. In 1900 Luithlen described a case as a "peculiar form of acne with changes in the sweat glands." But it is to a monograph by Jadassohn, published in 1901, that we owe the first distinct recognition of this affection as a separate malady, under the name of Granulosis rubra nasi. Several other writers have described cases since, and at the present time some 60 examples have been recorded. Dr. MacLeod called attention to the affection in this country by two articles in 1903 and 1906.

**Etiology.**—*Age.*—The disease is one of childhood, and it may begin at quite an early age: Dr. MacLeod saw a case at six months of age. Two cases only have been recorded in adults, one by Pinkus in a man of fifty-nine years associated with hidrocystoma, and one by Lebet. Usually the affection disappears at or about puberty.

*Sex.*—Boys and girls are affected in equal proportion. There is some tendency to family incidence. Two children in the same family were attacked in the examples reported by Pringle, Hallopeau, and Culmann. In one of Pick's cases the child's mother had the complaint. In Dubreuilh's case with hyperidrosis and hidrocystoma in a child aged seven years, a sister and the father had persistent hyperidrosis of the nose.

The true nature of the affection is not known, but it seems probable that the essential part is the hyperidrosis, and that the sequence of events is hyperidrosis with or without associated erythema, inflammatory micro-papules, hidrocystoma. The malady has been regarded as merely one symptom of the general vasomotor disturbance of the extremities which is seen in the condition known as "chilblain circulation," but it must be admitted that whilst chilblain circulation with cold and blue extremities is very common in children, granulosis rubra nasi is comparatively rare.

FIG. 143.—Granulosis rubra nasi (from a photograph kindly lent by Dr. T. Colcott Fox).

**Pathology.**—The lesions have been examined microscopically by several observers, who have found a moderate cell-infiltration around the ducts of the sweat glands consisting of mononuclear cells (fibroblasts) and some plasma cells, Jadassohn alone having noted giant cells. The blood-vessels of the superficial plexus are dilated, with slight cell-infiltration round them. Below the level of the cell-infiltration the sweat duct may be dilated. If the cell-infiltration has become organised into fibrous tissue so that the duct has become obstructed, there is cystic dilatation of the sweat duct. It has been suggested that the cell-infiltration at the mouth of the sweat duct is the result of irritation from the sweat, so that this and the subsequent cystic dilatation are sequels of the hyperidrosis. Lebet thinks that the occasional formation of cysts in granulosis rubra nasi throws a light upon their formation in hidrocystoma.

**Symptoms.**—The most striking features of the malady are redness and hyperidrosis of the end of the nose and of the alae nasi. That part of the skin of the nose which covers the cartilaginous portion is the most often affected, but in some cases the redness and sweating have extended on to the upper lip or on to the cheeks, or even on to the forehead. Associated with the redness there may be minute reddish-brown papules or papulo-macules, which give rise to the granular appearance from which the affection gets its name, and, in some cases, there have been also pin-head-sized or larger clear white or bluish cysts (Fig. 143). The nose is cold to the touch, and in winter dusky-red or purplish rather than red. Beads of sweat cover the red areas. It is now admitted that in a large number of cases—probably the majority—only sweating and redness are

present, without granules or cysts, and there are many cases of persistent hyperidrosis nasi in children without redness which are probably of the same nature (Colcott Fox). Subjective sensations are generally absent, though there may be some pruritus, or a sensation of cold at the end of the nose. Children with this affection are said to be usually ill-nourished and delicate, often with cold hands and feet, and sometimes with hyperidrosis of the palms and soles.

**Diagnosis.**—The disease with which granulosis rubra nasi is most likely to be confused is lupus vulgaris, particularly with that form of lupus of the nose in which the apple-jelly nodules are small and discrete, and it is for this affection that cases were probably mistaken before the disease was recognised as an entity. The associated hyperidrosis and the disappearance of the granules on pressure are the two main points of clinical distinction from lupus vulgaris.

**Treatment.**—Temporary benefit has been obtained from the use of various local applications. Lebet recommends bathing with very hot water followed by tannoform powder during the day and a sulphur-resorcín and talc lotion at night. Ricard has suggested the application of wool-pads soaked in 1 in 1000 adrenalin solution. A simple application is a dusting powder of zinc oxide with tannic acid.

Malherbe used repeated quadrilateral scarifications, in one case under the impression that it was lupus, in a second on account of the excellent results obtained in the first case. It must be remembered, however, that the disease tends to get well at puberty, and it may be a question if it is not better to wait rather than to use scarification. Measures should be taken to improve the general health. The good results in hyperidrosis of the axillae and of the palms from the application of *x*-rays have suggested the employment of this agency in granulosis rubra nasi, and Jeanselme has reported two cases treated by this method with complete, and apparently permanent, success. The treatment comprised five to six sittings, with doses varying from two to five Holtznecht units (from a third of a pastille dose to a full pastille dose), and intervals of about two weeks between each dose.

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POROKERATOSIS (Mibelli) (πόρος, a canal; κέρας, a horn).—SYN.: *Hyperkeratosis eccentrica* (Respighi).

**Definition.**—Porokeratosis is the name given to a recently described affection of the skin, which is characterised by lesions consisting of raised hyperkeratotic rings enclosing a more or less atrophic area, of extremely chronic nature, and with a well-marked tendency to appear in several members of one family. By some observers it is thought that the hyperkeratosis begins at the mouths of the sweat ducts, though this is denied by others.

**History.**—This affection was first described by Mibelli and by Respighi simultaneously in Italy in 1893. Several of the cases described by Mibelli and Respighi had been under the care of Majocchi, who had recognised the disease since 1885, and had demonstrated it to his pupils, but had not published any account of it. In the following years Hutchins, Gilchrist, and Wende in America, and Reisner and Max Joseph in Germany, published further examples. Since then many other cases have been described, chiefly in Italy; and Mibelli, in reporting two new examples in 1905, stated that about 40 cases had been recorded. Dr. Galloway shewed a case at a meeting of the Dermatological Society of London in June 1901 (*vide* Fig. 144). Brocq and Pautrier published the first authentic case in France in July 1907.

**Etiology.**—The affection may be observed at all periods of life from infancy to old age, the majority of cases occurring in youth or adolescence. It is seen most often among the labouring classes, and especially in agricultural labourers. Ducrey and Respighi state that two-thirds of the cases are in males. Very frequently several members of a family are affected. Mibelli has recorded the case of a young man whose paternal grandfather, father, paternal uncle, and two brothers were similarly attacked. Gilchrist has reported eleven cases in four generations of one family. Except for these points little or nothing is known of the etiology of the disease. A remarkable and unique case reported by Truffi of porokeratosis with the distribution of a very extensive unilateral linear naevus is regarded by him as "a new and important argument in favour of the naevus nature of porokeratosis."

**Morbid Anatomy.**—The whole of the lesion, including the central area, shews a condition of hyperkeratosis, with a certain amount of porokeratosis, as indicated by the persistence of the nuclei of the cells of the deeper horny layers. The prickle-cell layer is, on the whole, atrophied rather than hypertrophied, though the interpapillary prolongations are widened and elongated. In the corium there is a slight cell-infiltration, mostly around the vessels and below those parts of the epidermis where hyperkeratosis is more marked. The hyperkeratosis is most prominent in the raised marginal rim of the lesion. The horny crest which fills the groove is sharply marked off, by its different manner of staining, from the superficial horny layers upon which it rests. The horny crest or plug may extend at its lowest part down almost to the prickle-layer, which is here atrophied; and it is joined at this point by

a sweat duct. In the same manner, according to Mibelli, a sweat duct meets the lowest point of the horny plug in the primary papular lesion—the hyperkeratosis begins, in fact, at the mouth of the sweat duct. Respighi considers, however, that the primary lesion may appear at points which do not correspond to sweat ducts, and in mucous membranes this origin is of course impossible. For this reason he objects to the title porokeratosis.

**Symptoms.**—The affection generally begins as a single lesion on one extremity. This lesion may remain isolated for long periods, sometimes

FIG. 144.—Porokeratosis or hyperkeratosis eccentrica. The patient, a young woman, 23 years of age, who had always lived in London, had suffered from the disease for six years previous to the date of this photograph. In addition to the patches on her hands she presented a small ring of the disease at the left angle of the mouth, involving principally the red portion of the lips. The case was shewn by Dr. Galloway at a meeting of the Dermatological Society of London in June 1901. (From a photograph kindly lent by Dr. James Galloway.)

over several years. It is then followed at long intervals by successive lesions on the same or opposite limb, until finally they become numerous on the extremities and other parts. The favourite sites are the backs of the hands and feet, the face and the genital organs, but lesions may also occur in other regions and also upon mucous membranes.

The primary lesion consists of a conical horny papule, having a crater-like depression at its summit, in which is embedded a hard horny plug. This horny-centred papule very gradually expands to form a ring-like lesion.

The more advanced ring-like lesion consists of a central area sur-

rounded by a narrow raised rim. It may be from a few lines to an inch or more in diamater. In contour it is generally rounded, but often with a wavy margin, and sometimes it is quite irregular in shape. The peripheral rim of the lesion forms the most strikingly characteristic feature of the eruption. Its outer surface rises abruptly from the normal skin without there being any redness or other visible change in the latter. Its form is that of a prism, the summit of which presents a somewhat deep depression or canal in which is planted a hard, adherent, raised horny scale, forming a crest along the edge of the rim which is easily felt by the finger. Both the groove and its horny crest encircle the rim in its entirety. The horny scale adheres as a rule to the inner wall of the groove. The rim is dirty grey or brownish-grey in colour. It has the appearance of being made up of the epithelial layers without thickening of the cutis. The rim or ridge just described encloses an area which has a more or less atrophic appearance, and which may or may not be covered with adherent stratified horny flakes. Sometimes the central area may be apparently normal skin. Often it is the seat of papules like those of the elementary lesion already described.

The evolution of these lesions is very slow indeed; some of them may remain without noticeable change for months; others by eccentric growth come to touch neighbouring lesions, and gyrate figures are thus formed. The lesions sometimes disappear spontaneously, leaving only a fine atrophic, and slightly depressed patch to mark their seat.

Although the regular grooved border forms the most notable character of this eruption, in a few cases this feature may be wanting in the majority of the lesions, being perhaps found only in one or two. The border may, for example, be broken or interrupted, or the groove with its horny scale may be absent. Though the ridge is usually single, in certain cases there have been several segments of circles within an outer rim.

The lesions of porokeratosis may also attack the buccal mucous membranes, where they are present in the form of oval or rounded patches, varying in size from that of a pin's head to a large lentil, the majority being small. The raised border is more appreciable to the touch than to sight. By confluence they may form kidney-shaped patches. The rim is of an opaque white colour "like a fine silk thread"; the central area is opaline. Usually the groove and crest are not seen, but Ducrey and Respighi have noted them in lesions on the palate. In some patches the raised border is interrupted and replaced by red depressions, and a similar appearance results from scratching away the border with the finger nail. Respighi has described lesions of the nails in cases in which a ring has formed on the finger at the side of the nail and extended on to the nail bed. The part of the nail affected becomes opaque, with a rough irregular surface.

The **diagnosis** is not difficult in a characteristic case, but when the bordering rim is broken or does not present the groove with horny crest, the diagnosis from the ringed form of lichen planus may be difficult. And in other cases difficulty may be experienced in distinguishing the

eruption from the atrophic form of lichen planus. To the "ringed-eruption" of Dr. Colcott Fox (lichen annularis, granuloma annulare), porokeratosis bears very little resemblance, for that affection presents distinct infiltration of the corium and exhibits little, if any, disturbance of the horny layer.

The possibility of a relationship between porokeratosis and lichen planus annularis is one which has received full consideration from the observers who first described this affection, and the following characters of porokeratosis have been insisted upon as stamping it as an independent disease :—That the affection begins most often as a single lesion, this being followed only after a long interval by fresh lesions; the extremely chronic course of the eruption; the absence of subjective symptoms; its occurrence in several members of one family; and the very special features of the lesions themselves.

**Treatment.**—This affection is very rebellious to treatment. Application of salicylic acid and other keratolytic drugs has led to temporary improvement, but not to permanent cure.

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**Punctate Keratosis** (Porokeratosis of some Writers).—Porokeratosis may occur under conditions other than those of the affection described by Mibelli and Respighi. The palmar and plantar hyperkeratosis of chronic arsenical poisoning is said to begin around the sweat-duct orifices. A case of keratosis of the palms and soles involving primarily the sweat orifices has been recorded by Besnier, and there is a model (No. 560) of this case in the St. Louis Hospital Museum labelled "symmetrical erythematous keratodermia of the extremities, punctate form of keratosis, localised to the sweat orifices, palm of hand." A similar case has been reported by Hallopeau and Claisse, one by Mentoux, and

more recently a case by de Beurmann and Gougerot. Thibierge mentions a remarkable case of disseminated congenital porokeratosis, models of which are in the St. Louis Museum.

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Kystes Graisseux Sudoripares.—Under this title Dubreuilh and Auché of Bordeaux described two unusual cases of multiple cystic dilatations of sweat glands, the contents of which were abundant in fat. One of these had previously been recorded by Sabrazès under a different title. The patients were aged seventy and seventy-one respectively, were anidrotic, and had rough skins. They suffered from slight general pruritus. The lesions consisted of innumerable tumours, varying in size from a hemp-seed to a hazel-nut, but averaging that of a pea, situated in the subcutaneous tissue or loosely attached to the lower surface of the dermis; in form they were globular or ovoid, in consistence either firm or fluctuating; they were scattered all over the body, but existed in immense numbers in the axillae.

When punctured they gave issue to almost pure fat or oil. *Microscopical examination* of numerous sections clearly revealed their origin in the sweat glands, and—in contradistinction to similar cystic dilatations of sebaceous glands—extremely few epithelial cells were present in their contents. An uninterrupted series of changes in the sweat coils was observed from the beginning up to the end of the disease.

These interesting observations lend powerful support to the views of Kölliker, Unna, and others as to the steatogenous functions of the sweat glands. The authors claim as a probable example of this disease a case recorded by Neuberger complicating another cutaneous condition; they suggest that possibly the affection is not a rare one. This opinion we cannot share.

**Differential Diagnosis.**—*Multiple cysts of the skin due to cysticerci*, and of very similar clinical characters to those under discussion, are of no infrequent occurrence. A microscopical examination of their contents, which are not oily, and invariably contain "hooklets," will prove their nature at once.

Far greater difficulty will be experienced in discriminating this disease from the *multiple follicular cysts of the skin*, described by Bosellini in a man aged forty-one, the clinical characters of which, as well as the chemical nature of the cystic contents, almost exactly corresponded with Dubreuilh's case. Excision of the cysts and careful microscopic examination, however, shewed their origin in the sebaceous glands, some scanty remains of which persisted in portions around the cyst walls.

A case identical with Bosellini's, but at first mistaken for an example of "kystes graisseux sudoripares," was exhibited to the Dermatological Society by one of us (J. J. P.) in 1898; it was published under the provisional name of *Steatocystoma multiplex*.

No **treatment** has yet been proposed for the disease, as it does not give rise to any symptoms of moment; excision of the cysts, if justifiable, seems the only feasible procedure.

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Sudamina.—Syn.: *Miliaria crystallina; Crystallina* (Unna). **Definition.**—An eruption of short duration, consisting of small, extremely superficial vesicles containing sweat, without any inflammatory phenomena.

**Pathology.**—The vesicles lie entirely between the layers of the stratum corneum, and sweat ducts can be easily seen opening into them at their lowest part (Török). Their contents consist of sweat, and may be either slightly acid, alkaline, or neutral in reaction. Pollitzer, who recognises that sweating is not a necessary concomitant, suggests that possibly nutritive changes in the skin, due to the state of vital depression of the patient, produce a modified keratinisation and are a factor in the obstruction at the orifice of the sweat pore, which must undoubtedly exist. "The stopping of the pore takes place when the skin is dry and the sweat function is in abeyance. The first outpour of sweat must dilate the duct just below the point of obstruction."

**Symptoms.**—Sudamina always appear suddenly, either in the course of acute febrile diseases—especially enteric fever, rheumatic fever, and pneumonia—or immediately before death as an agonal phenomenon. They are usually connected with excessive sweating, especially of a so-called "critical" nature; but they may appear on a perfectly dry and very hot skin, where perspiration is deficient (Liveing).

The rash is most abundant on the trunk, chest, and neck; but it may be present anywhere. The lesions may be few in number, or extremely numerous; although generally discrete and small in size, they may coalesce and form comparatively large superficial bullae. The surrounding skin is unaltered in colour. The vesicles are so thin-walled, and their contents so pellucid, that they look like drops of water on the skin. Their contents may become slightly turbid and milky in appearance, especially if poultices have been applied. They do not cause any subjective symptoms. Rupture of the vesicles occurs in a few days, a little desquamation ensues, and no trace of the eruption is left behind. Sometimes, however, successive crops arise.

The disease is of no diagnostic or prognostic significance. Radcliffe

Crocker recorded a case of *chronic miliaria* occurring upon the palms and soles of a woman aged fifty-six, and lasting for years; the precise nature of the affection has not been settled.

No treatment is called for.

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Miliaria Rubra.—Syn.: *Prickly heat; Lichen tropicus; Miliaria papulosa et vesiculosa; Strophulus Infantum.*

**Definition.**—An acute eruption of papules and vesicles, for the most part around the sweat pores, accompanied by much itching and tending to relapse.

**Etiology.**—The disease is always met with in hot weather, and is therefore most common and most severe in the tropics, especially among persons born in temperate climates. Negroes are never affected, probably on account of the naturally free lubrication of their skins. Any part of the body may be affected, but the sites of predilection of the eruption are the back and trunk, the face and arms being rather less frequently attacked. In our experience people who have suffered in the tropics are peculiarly prone to relapse in temperate climates in comparatively warm weather. Persons wearing an excessive amount of clothing, particularly of flannel, are especially liable to prickly heat; as for the same reason are infants, in whom the affection ("red-gum") may, very rarely, be unilateral, and confined to the side of the face and arm habitually held to the mother in nursing.

**Morbid Anatomy.**—Although clinically nothing could be more evident than the connexion of this condition with excessive sweating, there is some difference of opinion as to the nature of this association. The chief changes are found in the epidermis. In the rete are numerous rounded cyst-like spaces, the contents of which may be clear or comparatively rich in cellular elements and epithelial debris. Robinson, who was the first to examine these lesions, believed that they were the result of an inflammatory process around a sweat duct, not a lesion formed simply by retained sweat, and Török was unable to trace any connexion between these vesicles and the sweat ducts; but subsequently Pollitzer, in a paper based on a microscopical examination of numerous serial sections of 8 cases in different stages, shewed that they were dilated sweat ducts. The coexistence of vesicles indistinguishable from those of eczema is, however, admitted by this author as an epiphenomenon. The cells of the horny layer are swollen and vesicular-looking; and their nuclei persist in rod-like form, especially round the sweat pores. The vessels in the papillary layer of the corium are congested and surrounded by moderate leucocytic infiltration. There are no well-defined morbid changes in the coil glands themselves.

**Pathogeny.**—The cystic dilatation of the sweat ducts is due to obstruction at their orifices. This is probably caused by the swollen condition of the cells of the horny layer already referred to, which occludes the sweat pores at a time when the sweat secretion is in abeyance. With the succeeding flow of sweat the duct dilates, and this continues until the tunnel-shaped spiral canals through the epidermic layers are formed. Pollitzer makes an ingenious suggestion as to the freedom of negroes and southern races from the disease, which may also apply to the immunity enjoyed by many natives of temperate climates; namely, that in unaffected persons the epidermis is unusually well lubricated with oil and epidermic cells permeated with fat, which do not absorb water and therefore will not swell and occlude the sweat ducts.

Unna, arguing from the analogy to cheiro-pompholyx, suggests the possible agency of micro-organisms; but there seems to be no positive evidence in favour of the notion.

**Symptoms.**—The onset is usually sudden, and may follow a full meal or the ingestion of copious hot and alcoholic drinks. The affected skin is intensely itchy, burning, and red. On examination it will be found thickly studded with innumerable small acuminate papules, and especially vesicles, from the size of a pin's point to a pin's head, containing clear alkaline fluid, and surrounded by a narrow red zone. In tropical cases the number of papules is greater than that of the vesicles, hence the misleading name "lichen" attached to the condition; the affected areas are extensive, and the suffering is often excruciating. Copious general sweating almost always precedes and accompanies the eruption, the elementary lesions of which can be seen, with a lens, to involve the sweat pores and their immediate vicinity.

The vesicles always remain discrete; in a few days their contents become opaque and milky (*miliaria alba*); they never discharge spontaneously, or give rise to any general weeping, except as the result of scratching or injudicious treatment; therein they present a marked contrast to all forms of "eczema." Unless severely scratched they soon dry up, minute scabs form, and recovery ensues in about a week; but relapses are very apt to occur as long as warm weather persists. Anything calculated to promote sweating, such as exercise or hot drinks, always aggravates an attack and provokes increased irritation.

Cessation of the cause is generally accompanied by immediate subsidence of the eruption and its symptoms, but with their cause these tend to recur indefinitely.

**Differential Diagnosis.**—This need only be established from eczema and sudamina and acute generalised lichen planus. Prickly heat is distinguished by its rapidity of onset, its patchy distribution, its seat, its transitory nature, the absence of all discharge, the coexistence of copious sweating, and the concomitant etiological conditions of hot weather, or unsuitable (flannel) or excessive clothing. Careful examination will of course reveal the presence of typical polygonal papules in case of acute lichen planus.

It must not be forgotten, however, that secondary eczema and pus infections may result from scratching or other mechanical irritation, or in obese persons in positions liable to intertrigo.

The **prognosis** may be inferred from the foregoing sketch.

**Treatment.**—The first indication is the removal of the proximate cause. In severe cases persistent changes from a tropical to a temperate or hill climate may be necessary, or a sea-voyage may for a time be efficacious. Attention to the underclothing is of prime importance; silk or fine woollen materials being greatly preferable to cotton or linen, as they lessen the risk of chills or rapid changes of skin temperature. The underwear should be frequently changed. The diet ought to be simple, nutritious, but non-stimulating; and alcohol is certainly most deleterious. During the acute period of an attack the bowels should be kept well open with salines; and diuretics, more especially the acetate and nitrate of potassium, are generally useful. Lemon or lime juice in barley-water makes an excellent cooling drink.

Locally, evaporating lotions are of service, such as weak solutions of liquor carbonis detergens with lead or spirit, or lotions leaving a powder on the surface, such as the familiar calamine lotion, made up with cherry laurel water. Alkaline, borax, or bran baths, at 90° to 95° F., are useful; and free dusting with zinc oxide, boric acid, or starch powder often gives much relief. The addition of 2 to 3 per cent of ichthyol to either lotions or powders lessens the risk of eczema.

The inunction of the body after the morning bath with vaseline or some fatty material is a valuable prophylactic in persons subject to attack.

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Miliary Fever.—Syn.: *Sweating sickness*; "*La suette anglaise*"; "*La suette des Picards.*"

**Historical.**—This curious malady was first observed in England in 1485; subsequent epidemics occurred in Calais, among the English inhabitants only, in 1507, 1518, 1529, and 1551. The disease also occurred in Germany in 1652, 1802, 1864; and in France in 1718 (2). A severe epidemic somewhat recently prevailed in the central provinces of France (1).

**Symptoms.**—The onset of the disease is sudden, and is ushered in by profuse, often fetid, sweating with dyspnoea and malaise; the tongue is coated, headache is complained of, and cerebral symptoms are common. The rash appears at the end of two to four days. The skin becomes red, either all over or in patches; minute acuminate papules arise on the reddened areas, which soon become vesicular; the lesions having all the characters of sudamina or miliaria rubra. Similar phlyctenules appear

on the mucous membrane of the mouth, tongue, and palate. As the eruption first shews itself on the face the disease is very apt to be mistaken for measles.

Desquamation soon ensues, beginning on the face and extending downwards. The scales are fine and branny over the trunk, but large flakes may form on the hands and feet. The tongue also desquamates. There is high fever and great prostration, and often a fatal ending. The nature of the contagium is quite unknown.

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POMPHOLYX (πομφόλυξ, a bubble).—SYN. : *Cheiro-pompholyx* (Hutchinson) ; *Dysidrosis* (Tilbury Fox).[1]

**Definition.**—An acute or subacute inflammatory disorder of the hands and feet, usually associated with excessive sweating, and characterised by the appearance of peculiar grouped vesicles or blebs which do not rupture spontaneously. The disease has a marked tendency to seasonal recurrences.

**Historical.**—The first published account of the disease is by Tilbury Fox, who called it Dysidrosis, and considered the vesicles as the result of sweat retention. Sir J. Hutchinson in a lecture delivered in 1871, but not published till 1876, contested Tilbury Fox's views as to the sweat origin of the eruption, and proposed the name Cheiro-pompholyx. Robinson's nomenclature of pompholyx is now generally adopted as more comprehensive than Hutchinson's. In Germany the condition is almost universally considered a form of eczema ; a view which is shared by Drs. Colcott Fox and Whitfield in this country. In France, however, Tilbury Fox's name is generally used, and the disease is regarded as one *sui generis.*

**Etiology.**—Women are certainly more frequently attacked than men. The disease is stated to be rare before puberty—an opinion with which we disagree—and after middle life. Its subjects are generally neurotic, overworked, or underfed ; and in such persons the handling of irritating substances (for example, dyes) seems sometimes concerned in its production. It is common in spring and summer, but rare in winter. It generally recurs for years in circumstances similar to those in which it first arises.

**Morbid Anatomy and Pathology.**—Tilbury Fox, who first demonstrated the clinical features of the disease with absolute accuracy, subsequently described its morbid anatomy. He regarded the characteristic vesicles as dilatations of the sweat ducts caused by some obstruction at their orifices. Robinson, Santi, and Winkelried Williams believe—

[1] The name Pompholyx, as synonymous with Pemphigus (Willan and Bateman), has long been obsolete.

the latter from the examination of 229 serial sections of pieces of skin from his own hands—that the vesicles are not dilated sweat-ducts, but are very similar to the vesicular lesions of eczema. Crocker, who at first adopted Tilbury Fox's views in a conjoint paper, subsequently changed his opinion.

Unna claimed that he had found the cause of pompholyx in a special bacillus, which is present, either singly or in groups of two or three, in the contents and roof of the vesicles. They are best stained by the iodine method, and are the same length as tubercle bacilli ($2\frac{1}{2}$ to $3\frac{1}{2}$ $\mu$), but broader ($\frac{1}{2}$ to $\frac{2}{3}$ $\mu$). They are most abundant, and in clumps in the roof of the vesicle. In comparison with the staphylococci of impetigo they are present in small numbers, and must, therefore, have a powerful chemiotactic action. Their presence is constant, and no other organisms are present. Unna makes the following interesting surmise as to the pathogenesis of the affection:—"In the thick horny layer of the palm of the hand of certain individuals definite pathophoric bacilli lead a latent existence. The increased sweating in summer or in the course of certain diseases is necessary to induce their proliferation, and this is naturally most active in the neighbourhood of the sweat pores. Here there ensues a maceration of certain basal horny cells, and then rapidly, if the part is scratched, a chemiotactic setting free of fibrinous exudation with a few leucocytes. The organisms disperse themselves in the vesicles, which increase until the bacilli, after about a week, die; the vesicle is then encapsuled by a new horny layer, and then the attack of cheiro-pompholyx is ended." In addition to the typical pompholyx vesicle sudamina are often present, but they do not give rise to any special symptoms and are not perceptible to the naked eye. It may be added that Unna's discovery of the bacteria, upon which these views are founded, has not received any confirmation from other observers.

The original view of Tilbury Fox has quite recently (in 1906) been adopted by Nestorowsky, who, after a study of no less than 2800 sections from six characteristic cases, has arrived at the conclusion that dysidrosis is undoubtedly a disease of the sweat glands, and that the dysidrotic vesicles are in intimate relation with the canals of these glands. He says that hyperidrosis alone does not produce cheiro-pompholyx, but only in combination with trophic nerve-disturbance, which lowers the skin's resistance, or perhaps from some special property of the sweat secreted. As a result there is a swelling of the horny layer, its detachment, and an obliteration of the sweat ducts by plugs of horny substance. The obliteration of the sweat ducts leads to dilatation and rupture of their orifices, followed by the discharge of sweat into the neighbouring epidermic tissue. The cells exposed to the action of the sweat swell, and eventually necrose. Retention of the sweat causes swelling and necrosis of the cells of the ducts and glands. Vesicles are also formed in the upper and middle, less often in the deeper parts of the prickle-cell layer by rupture of the ducts in these situations and the spread of the sweat between the horny layers, and the solution of the cells of the

stratum granulosum also allows it to reach the prickle-cell layer. Large bullae result from confluence of smaller ones. The development of large bullae coincides with the complete atrophy of sweat ducts and corresponding sweat glands, and the atrophy of these structures determines the regression of the bullae. The regeneration of the epithelium takes place from those cells of the stratum granulosum and of the prickle-cell layer which remain intact. There are no signs of inflammation in the early stage of dysidrosis, but only when large bullae are formed, and they must be regarded as a secondary phenomenon.

FIG. 145.—Dysidrosis. From the original water-colour drawing of Tilbury Fox (kindly lent by Dr. T. Colcott Fox).

**Symptoms.**—The onset of an attack of pompholyx, which is almost invariably coincident with sudden hot weather, is usually preceded by burning, tingling, itching, stiffness, or even acute pain in the hands, or more rarely, in the feet. Soon deeply set vesicles appear, either singly or in small groups, on the palms and interdigital spaces, or along the sides of the fingers. In exceptional cases the backs of the hands or even the wrists are invaded, and similar vesicles may appear in corresponding positions on the feet. The lesions are usually roughly symmetrical, but one side is usually worse than the other. In rare instances the feet alone may be attacked.

In the earliest stage small transparent rings of fluid are visible round the sweat orifices (Tilbury Fox, Crocker), but this appearance is of very short duration. As the vesicles enlarge they resemble boiled sago-grains embedded in the skin, and often shew a dark point in the centre. In this stage the eruption is as perceptible to touch as to sight. The vesicular contents, at first clear, soon become turbid; in reaction they

are neutral or alkaline. There is very slight inflammatory redness of the skin, if any; but oedema is generally marked, causing much stiffness and discomfort. The number of vesicles may increase enormously, and they often coalesce to form large blebs which tend to be flat on the sides of the fingers and semi-globular on the palms. The blebs being formed by the coalescence of numerous vesicles are multilocular, and may be as large as an inch in diameter. The lesions do not rupture spontaneously; their contents are absorbed, and at the end of ten days or a fortnight the epidermis which has become dried and brown is exfoliated either in small pieces or in large flakes, leaving the skin underneath red and tender, but never moist or weeping as in an eczema, unless secondary infection has taken place.

Before and during the eruption the hands are often markedly hyperidrotic, but this is certainly not always the case (Hutchinson, Jamieson). After the shedding of the epidermis the skin soon hardens, but relapses may occur, prolonging the duration of the disease over some weeks. After each attack the nails often shew transverse furrows. Rather severe general symptoms usually accompany an attack such as has just been described. Prominent among these are malaise, shiverings or heats, anxiety, and depression of spirits. Before the attack the patients are seldom in good general condition, and usually have clammy hands.

*Variants.*—Mild or abortive cases of pompholyx are of very common occurrence, and their nature frequently passes unrecognised; in these cases only a few sago-grain-like vesicles appear in the palm, over the hypothenar eminences, or along the edges of the fingers, accompanied by itching, hyperidrosis, and perhaps some depression of spirits. Crocker doubted if such cases should be regarded as pompholyx; but we have observed many instances, relapsing regularly every spring or summer, and sometimes merging into typical cases such as have just been described. On the other hand, in an extremely neurotic American, relapse succeeded upon relapse—under our observation—for more than three months; and the disease had existed for several years almost without remission.

In some severe cases an eruption may appear on the forearms in direct anatomical continuity with the pompholyx, or on distant parts of the body, which is usually described as an eczema. Careful examination will reveal, however, that in many cases this extension is not of the nature of a true eczema, but rather of miliaria rubra or prickly heat, a condition very closely allied to pompholyx; whilst other cases are apparently pyogenetic complications.

**Diagnosis.**—In the earlier stages the itching vesicles may be mistaken for scabies, but careful examination will always prevent the commission of such an error. Acute eczema of the hands is much more difficult to discriminate, and as already stated, the distinction is not admitted by all. The crucial points of difference have been indicated in the article; but it must be borne in mind that by poulticing or other injudicious treatment a true catarrhal dermatitis may be set up.

**Treatment.**—The general condition of the health must first be improved and the nervous system more especially braced up. Rest, mental relaxation or diversion, and change of air, ought all to be recommended according to circumstances. Internally, strychnine, iron, quinine, hypophosphites, lactophosphates, and cod-liver oil are valuable tonics; and arsenic, pushed so as to produce its physiological effects, is probably instrumental in warding off relapses. Alcohol, tobacco, tea, and coffee are almost always injurious.

Local treatment is of primary importance in warding off pyogenetic complications. The continuous or prolonged immersion of the implicated parts in a warm saturated solution of boric acid in an arm- or leg-bath has in our experience afforded admirable results. Weak astringent or antipruritic lotions may be used, but as a rule emollient ointments, constantly and carefully applied on strips of linen, afford more relief; such are zinc oxide or zinc oleate ointment, cold cream, Lassar's paste, with the addition of a small percentage of resorcin, carbolic acid, lysol, or similar substances. Above all things, no strong application must be employed.

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# DISEASES OF THE SEBACEOUS GLANDS

By T. Colcott Fox, M.B., F.R.C.P.

## Acne

**Introduction.**—The word Acne, according to Littré, was altered by a copyist from ἀκμή (a point). Since the application of the term by Willan and Bateman to denote a number of special eruptions, it was extended, especially in France, to a host of eruptions, including functional disturbance of the sebaceous glands, epithelial plugging of the pilo-sebaceous follicles, inflammatory papulo-pustular eruptions, often peri-follicular and simulating true acne, such as the acneiform syphilides and tuberculides, lesions due to the ingestion of such drugs as potassium bromide and iodide, from external irritation (folliculitis), and lastly

structural disorders such as milium (acne albida). In 1898 Touton said that in default of an ideal etiological basis numerous eruptions were classified as acne on an anatomo-pathological standard, but he included eruptions due to drugs. An etiological basis has, however, been put forward. Unna and Hodara concluded that the true acne was an infection brought about by a micro-bacillus discovered by Unna in the comedo, and Sabouraud has gone farther in stating that the basis of true acne is infection of the pilo-sebaceous follicles by the micro-bacillus of Unna, causing increased formation of sebum, eventually encysting itself in the follicles, and that the succeeding inflammation is due to a secondary infection by a staphylococcus. Two main forms, acne vulgaris and acne varioliformis, will be described here; but Sabouraud adds to his list furunculoid acne of the neck, and acne cheloid, which are considered under staphylococcic infections (*vide* p. 193).

ACNE VULGARIS—SYN.: *Polymorphic Acne*—**Etiology.**—Acne is an eruption connected with the pilo-sebaceous apparatus, and is essentially associated with the evolution of puberty, probably to an equal extent in the two sexes. When once established it may last for many years. As long as any follicles remain involved, inflammatory processes may arise from time to time well on in life. In the past this eruption has been ascribed to an innate disposition, expressed chiefly during the augmentation of the pilo-sebaceous apparatus in the evolution of puberty; to various constitutional agencies, such as influences excited during the evolution of puberty, or by disorders of the genital organs, or by some habits in relation to these parts. Gastro-intestinal disorders, perhaps due to diet with excess of fatty food, have also been incriminated; Kapp found in 94·9 per cent clear evidence at puberty of abnormal putrefactive changes in the intestine, as evidenced by the presence of indican, phenol, and cresol in the urine. A patient under my care with chronic stomatitis and presumably a similar state of the stomach resisted all treatment until a herbalist treated her with the old-fashioned infusion of horse-radish. There is little doubt that, whatever the direct cause, numerous constitutional conditions favour the local process, and quite commonly patients with acne have anaemia, gastro-intestinal disorders, constipation, or genital troubles. Unna's discovery of a micro-bacillus in the comedones and later researches have pointed to the direct causation by this organism, and perhaps to the further action of a secondary staphylococcus with grey cultures in setting up suppurative inflammation.

**Pathogeny and Morbid Anatomy.**—Formerly there were various hypotheses to account for the occurrence of comedones, such as alteration in the quality of the sebum at its formation, retention of sebum, or inefficient action of the arrector muscles allowing its undue accumulation. In 1893 Unna demonstrated the real epithelial formation of the comedo, and discovered in it the constant presence of a micro-bacillus (acne bacillus), which he did not cultivate, but regarded as the probable cause of the comedo and pustulation on the grounds that it

was the only organism constantly present; that it was deeply encysted in the comedo in contrast to the superficial occurrence of other organisms (staphylococci and the bottle bacillus); and that the pustular inflammation had not the characters of the ordinary staphylococcic infections. Later Sabouraud established the existence of the early seborrhoeic stage, in which the follicular concretions are almost entirely fatty, dissolve in ether, and, when pressed out on tissue-paper, leave practically only a stain. He found that these early filaments also contained the micro-bacillus (*bacille de séborrhée grasse*) which he regarded as the cause of the seborrhoea and of the secondary changes, exciting the successive layers of corneous cells exfoliated in the upper part of the follicle to form a cyst nearly obliterating the antecedent fatty concretion and enclosing in the centre a pure culture of the micro-bacillus. These comedones distend and plug the follicle, preventing the exit of sebum. Dr. Whitfield amongst others questions the causation of seborrhoea by the bacilli, which he thinks find a favourable soil in the follicle and form the comedo (*vide* p. 7). Dr. Western also points out the frequent occurrence of seborrhoea in the black races presumably not due to the bacillus. The characteristic "black head" is probably due, as pointed out by Unna, to the breaking down of keratin. According to Sabouraud, the bacillus not only produces the excessive output of sebum, but encysts itself, and gradually causes destruction of hairs and hypertrophy of the sebaceous glands. The causation of the suppurative inflammation has been much discussed. Unna suggested the bacillus as the cause. Sabouraud, on the other hand, considers that, although the bacillus may exist alone, the secondary invasion of a special staphylococcus producing grey cultures is responsible. He and others have described the entrance of this organism into the top and outer layers of the old degenerated comedones. In this site it produces little reaction, but may excite the formation of the papule, and this often suppurates around the mouth of the follicle. Penetrating deeper, it sets up a second abscess communicating with the orificial one in the form of an hour-glass. Deeper still it may cause localised suppurative inflammation, especially persistent indurated nodules containing a drop of pus, and rarely more acute abscesses. He notes, as Unna did, the peculiarity of the pus, and points out the comparatively feeble power of these staphylococci, which soon get killed in the contest, so that old collections of pus may be sterile. Again, these deep lesions become enclosed by fibrosis of the surrounding connective-tissue, and the pus is peculiar in containing abundant polynuclear cells, some early stages of giant cells, macrophages, and plasma cells. Dr. Whitfield supports Sabouraud's contention so far. Gilchrist published his researches in 1899 and 1903. He found what he called the *Bacillus acnes* present in all smears taken from 240 typical acne lesions in eighty-six patients, and pure cultures were obtained from sixty-two lesions, which were chiefly nodules, in twenty-nine patients. Of these cultures eighty-two were sterile, and he attributed seventy of these to the use of an improper medium. Other cultures shewed either

the bacillus alone or a staphylococcus (called *S. epidermidis albus*), or a mixture. Acne pustules he found at the lower part of the greatly distended follicle, which was surrounded by a mass of polymorphonuclear leucocytes and nuclear detritus. Sections of nodules shewed profound changes extending deeply into the corium, surrounding in some nodules a magnified and hypertrophic follicle. The lesion was made up of masses of cells, including many giant cells, plasma cells numerous in some nodules but replaced in others by lymphoid or connective-tissue cells, polymorphonuclear cells massed in some sections to form miliary abscesses, phagocytes, and pigment cells. Some of the giant cells contained bacilli.

Dr. Alexander Fleming found that smears from acne pustules practically always shew the bacillus. It occurred alone in 44 per cent, and in 53 per cent with staphylococci in varying proportions. He obtained pure cultures of the bacillus thirteen times only out of 132 cultures, thirty-five were sterile, forty shewed both bacilli and staphylococci, forty-four staphylococci only. He gives, as evidence of the subordinate part played by the staphylococci, their absence or scanty number in many cases, and he does not think this explicable by the location of staphylococci in the walls of abscesses. Sabouraud, however, pointed out the slight pathogenetic power of these cocci and their early death. Dr. Fleming obtained *Staphylococcus pyogenes aureus* in two cases only. Lastly, Dr. Western concludes that this bacillus can, and does in many cases, act as a pyogenetic micro-organism, unassociated with any staphylococcic infection. This, he says, is most clearly seen in cases of abscesses shut in by the blocked follicle, and tracking along the skin, and possibly extending one or two inches in length. Such abscesses have thin walls and are not surrounded by much inflammation. If aspirated with a sterile syringe before bursting, the acne bacillus is always found and not the staphylococci.

*Cultures.*—Sabouraud was the first to cultivate the bacillus. The young forms are punctiform and very minute, so that they may be confused with cocci. The adult forms are more elongated, sigmoid, and very like tubercle bacilli. They may unite in chains, and these in bundles. They stain with all the basic aniline dyes, but retain them badly. By thionine they look a third the size they do with gentian violet, because the latter stains the thick envelope and the former does not. Sabouraud adds that an excellent stain for a film specimen is Gram-Weigert with a carmine differentiation of other histological elements. Culture presents difficulties. After much labour Sabouraud recommends the following method: Cleanse the site with soap and warm water, rinse away, dry, and apply pure official ether. Then squeeze out a filament, take it up with a sterilised needle, and place it on a sterilised glass slide. Then cut the centre into minute slices with a sterilised scalpel. Insert each piece half into the culture medium in a sloping tube. The medium recommended is the following:—Agar 15 grams, Chassaing's (Paris) granulated peptone 20 grams, neutral glycerin 20 grams, distilled water 1 litre, glacial acetic

acid 5 drops. Keep at a temperature 120° C. for three-quarters of an hour in the autoclave. Shake, do not neutralise, filter through Chardin filter-paper, pour into tubes, sterilise for a quarter of an hour at 120° C. Agar made some weeks and half dry gives more constant results. Cultures should be incubated at 37° C.

The micro-bacillus shews at the fourth day, but often the staphylococcus with grey cultures appears first. In twenty-eight days this staphylococcus dies, and a resowing gives pure cultures of the bacillus, which has the same character as seen in its parasitic life. Dr. Fleming has also studied various culture media, namely broth, ordinary agar rendered faintly acid with HCl, acid glycerin-agar, Sabouraud's special medium, and oleic acid glycerin-agar, and the latter he thinks far the best.

*Inoculation Experiments on the Pathogenicity of the Acne Bacillus.*—Sabouraud found inoculation of the cultures of the bacillus on the surface of the skin of the horse, sheep, dog, guinea-pig, and rabbit negative. Gilchrist in his first research obtained successful inoculations on mice and guinea-pigs; the animals died in about a week, and pure cultures of the bacilli were obtained from the different organs. Bollack's inoculation experiments were negative. Dr. Fleming rubbed vigorously into the skin of the forearm of a patient suffering from acne a week-old broth culture of acne bacillus freshly isolated from him, and at the same time repeated on the arm of another acne-free. In the first patient only the hair follicles of the rubbed region became inflamed and in five days pustules formed, and the films made shewed acne bacilli only.

*Serum Reactions of Infected Persons to the Bacilli.*—"Gilchrist found that the serum of his patients agglutinated the bacillus in a hundred-fold dilution, while his controls of healthy serum only agglutinated in a fifty-fold dilution." Dr. A. Fleming has been unable to reproduce these results in their entirety, but he obtained agglutination in several cases. He also found that the *opsonic index* in twenty persons varied considerably, but there is a tendency to the production of opsonin in infected persons.

**Symptoms.**—Apart from the morphology of the eruptions three features call for special attention. Polymorphic acne is associated in its installation with the evolution of puberty; it occupies by preference the face, the upper part of the back, the chest, and exceptionally other regions; it is essentially connected with the pilo-sebaceous apparatus, especially where there are lanugo hairs.

In the earliest period of the eruption a careful inspection of the sites infected shews that every pilo-sebaceous follicle is filled with a collection or concretion of solid-looking substance, which is easily extruded and found to be soluble in ether, and to be composed almost entirely of oil. This substance is constantly extruded, and makes the skin of the patient greasy and discoloured with a sallow tint, which at the first glance may suggest ill-health. It is interesting to note in these cases that in the hollow of the ears we can often see little drops of yellow oil standing at the mouths of follicles apparently without plugs. This

first stage is called seborrhoea or steatorrhoea by Sabouraud, that is, an increased formation of the sebum.

Darier, however, describes under the name *Kerosis* a chronic morbid state of the skin, characterised by a dull yellow, bistre, or greyish coloration of the skin; an accentuation of the pilo-sebaceous orifices; a slight thickening of the integument; and anatomically by a slight diffuse thickening of the corneous layer, a tendency to fine desquamation, a modification of unknown nature of its oil contents, and a hyperkeratosis of the pilo-sebaceous orifices. In itself of little importance it is interesting, he says, because it constitutes the substratum, necessary or habitual, of several common skin diseases, such as certain forms of pityriasis, seborrhoea, some alopecias and hypertrichoses, oily hyperidrosis, acne, rosacea, and many eczematides. Its distribution is at once diffuse and regional, with predilection for the centre of the face, especially the nose and the furrows around the alae, temples, chin, neck, and on the trunk an oval presternal and an interscapular area, but it may be more extensive. This state evolves from six to ten years of age. For a certain school, he adds, the manifestations of kerosis would be directly microbic. The presence of microbes is not contested, but their pathogenetic influence is not proved.

In the next stage a widely varying proportion of these early fatty concretions in the pilo-sebaceous follicles change in composition, or rather are supplanted by another formation. Substantial plugs form, dilating the mouths of the follicles, and are only squeezed out by some force as they are attached to the wall. They acquire "black heads," and are known as comedones. No sebum can pass by them. This phase is called acne punctata.

So far it will be noted there is no clinical sign of inflammation. After a time, however, as the plugs get larger, old, and degenerated, inflammation is apt to form about the follicles, and then this new feature becomes conspicuous. A number of plugged follicles, varying in number at times and in different cases, present red inflammatory papules about their orifices (acne papulata). Sometimes deeper and larger inflammatory nodules make their appearance (acne indurata), well illustrated in the portrait made for Willan and published by Bateman in his "Delineations." This inflammation generally suppurates, making superficial papulo-pustules or deeper abscesses (acne pustulosa). The superficial orificial pustulation tends to dry and crust, and, when this separates, brings away the loosened comedo. Sometimes indolent cold abscesses last weeks or months without marked reaction, and may eventually disappear, or reach the surface and discharge. Sabouraud also describes a frequent suppuration in a double hour-glass form, in which a superficial pustule is connected with a deeper collection. Sometimes deep abscesses form acutely. If the skin be sufficiently injured, scars may follow suppuration, and a curious deformity is sometimes brought about known as the double or triple comedo.

In addition various degenerative formations may be observed. Thus

exceedingly large comedones are called by the French "tannes." They may undergo further degeneration, and enlarge to the size of a haricot bean, and exude a yellowish, pasty, smelling, semi-fluid substance ("butyric cysts"). Mucoid cysts may also form from which a mucous, mucilaginous, or gelatinous matter can be squeezed out. This formation is due to a cystic degeneration of a long-obstructed sebaceous gland (Sabouraud). Either of these phases may dominate the scene in a given case, but the usual coexistence of several or all gives the polymorphic aspect to an established case.

The course is essentially chronic, though the process often dies away with adolescence. It may be quietly persistent, or marked by periods of exacerbation and calm.

There are one or two phases that call for special mention. Radcliffe Crocker differentiated, and I can confirm his observation, a peculiar phase in women which he called acne keratosa. He said it presented as well-defined excoriated patches, the size of the finger nails, covered with hard, blood-stained crusts, situated on the cheeks and chin, especially near the angles of the mouth. These lesions evolve bilaterally and singly, or in scanty number at irregular intervals. They commence as a red, firm, tender nodule, on which a pustule usually forms and dries into a scab, and the epidermis about is detached. There is an irresistible desire to keep worrying the lesion by squeezing and picking until a horny plug is extracted, and then the sore slowly heals. This state of affairs may persist for years.

To be distinguished from *A. keratosa* is the persistent *acne excoriata* of Brocq, sometimes seen in young girls. Its peculiar aspect is thought to be brought about by a morbid or hysterical impulse to be constantly picking the spots apart from any irritation, but Crocker inclined to the conclusion that there must be some irritation. Brocq also refers to, and we must all have seen it, deep indurations of the chin in women between twenty-five and forty-five years of age. They may form singly or in small numbers in constant succession, and contain drops of pus. They are generally associated with disorders of the uterus or its annexa. Follicular plugging in certain cases may last many years, and be but little pronounced, and then the pathogenetic process is excited by the onset of some ill-health.

**Treatment.**—This will vary with the different stages and phases of intensity. Whether the early seborrhoea is due to the micro-bacillus or not, the organism is there and should be removed or destroyed, as far as possible. After steaming or bathing with hot water the region involved, inunctions, judiciously repeated, may be made with an ether soap such as Blake's (liq. ammon. fort. ℥x.-xxx., ether ʒi., soft soap ʒi.), followed after washing and drying by the application of various powders or lotions, which have been thought to be effective. Sabouraud recommends three curative agents, the time-honoured sulphur and its compounds, the tars with pyroligneous derivatives, and mercurials. I do not know, however, of any definite research establishing a certain

destroyer of the micro-bacillus. Salicylic, tartaric, and acetic acids are said to act as mordants. The fatty concretions in the follicles may also be removed by mechanical methods.

Much the same may be said for the treatment of the acne punctata stage, but I wish to insist that it is absolutely necessary to extract the comedones; no comedones, no pustular inflammation. Unna also recommended for this stage a preparation composed of kaolin 4 parts, glycerin 3 parts, and acetic acid 2 parts, to which may or may not be added small quantities of etherised oil. He says that vinegar, lemon juice, and weak hydrochloric acid are useful. Another prescription is acetic acid ʒi., hydrogen peroxide, vaseline, anhydrous lanoline, āā ʒi., with a little vanilla essence. The eyes must be protected. After some days the comedones will be loosened, and many methods have been recommended for their extraction. The simplest plan is to express them with the finger nails guarded by a thin silk handkerchief, and this can be carried out by the patient over the central regions of the face. It is important that the medical attendant should make sure that it is done effectually, and some other person must be trained to operate on regions out of the patient's reach. I insist on this because patients raise all sorts of difficulties, and little progress may be made. As long as infected follicles exist, and they remain many years, there may be outbursts of suppurative inflammation from time to time, favoured by various conditions of health. There are numerous small instruments for extracting comedones, and they are useful in many cases. Massage has been recommended, but is not in favour with many authorities. Hyde introduced a roller for pressing the skin. Lastly, there is the method introduced in Germany of judiciously applying exfoliating applications which bring away the comedones, but it requires experience and necessitates complete control of the patient. Medicated soaps may be used, or an ointment composed of naphthol 10 parts, precipitated sulphur 50 parts, soft soap and vaseline, of each 20 parts; or resorcin, zinc oxide, and starch powder, of each 5 parts, with 10 parts of vaseline. These applications may be rubbed in for half to one hour, and repeated daily until the superficial skin is completely shed. Bronson recommended 40 per cent of resorcin in gelanthum.

After the comedones have been cleared away by mechanical methods, powders or lotions may be applied, such as perchloride of mercury, or so-called lotio alba, consisting of sulphurated potash, zinc sulphate, of each ʒi., glycerin ʒi., rose water to ℥iv., each salt being dissolved in half the rose water before mixing. It would be easy to multiply such formulas indefinitely, but those given will illustrate the principle.

We now come to the inflammatory phases, premising that the comedones have been extracted. The papular phase is usually easily controlled by the lotions already mentioned. Superficial pustules require incision and cleansing, with subsequent use of disinfectant applications. In severe cases with various complications, scarification and curetting have been recommended, but these proceedings seem unnecessarily severe.

Deep inflammatory induration and suppuration may persist for a considerable time, and are disfiguring both in themselves and on account of the resulting scars. The enclosed pus can be let out by incision with a fine blade, or a pointed thermo- or electro-cautery. A common practice is to inject the opened lesions with some carbolic acid. Induration may sometimes be resolved by such applications as a mercurial plaster, or iodine, and the colourless tincture may be tried.

Careful inquiry should be made as to the general health, especially as to the state of the gastro-intestinal and genital organs, and any disturbance should be corrected, for the local acne processes are distinctly aggravated by any disturbance of this kind.

Mention should be made of attempts to control the acne by oral remedies, such as arsenic, calcium sulphide, and yeast. By the above means it is generally possible to cure acne.

In recent years two special methods have become available. The *x*-rays have been much used, and undoubtedly do good in certain phases. If not carefully applied there is much risk of atrophy of the skin. Paul Gastou advised its use in persistent and obstinate cases only and after the failure of other forms of treatment. He advises doses of 2 or $2\frac{1}{2}$ Holtzknecht at intervals of 5–6 days. The total dose of 5–6 H should not be exceeded per week. It has been recommended that doses sufficient to set up *x*-ray dermatitis should be employed, but this is surely a risky procedure. It is stated that a slight anti-bacterial action is exerted, and that an elective action is exerted on the sebaceous glands.

In 1904 Sir A. Wright announced the treatment of 7 cases of severe and chronic acne by inoculation with a staphylococcic vaccine, but the source and exact nature of the vaccine was not discussed. This vaccine treatment has been largely carried into practice, but the varying opinions as to the pathogeny of acne in its different stages are of importance (*vide* pp. 7, 669). For this treatment Dr. Fleming classifies cases in three groups: (1) those in which the acne bacillus is the cause, including acne punctata and some cases of acne pustulosa and acne indurata; (2) mixed infections by the bacillus and staphylococcus, including mostly acne indurata and some of acne pustulosa; (3) those in which the staphylococci are the main cause. Gilchrist's experience is that in cases in which the *Bacillus acnes* grows in pure culture that organism should be used for vaccination, but many cases in which the *Staphylococcus albus* is a predominant secondary invader do well with a vaccine of the same. The ideal treatment, he said, was to employ both vaccines.

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ACNE VARIOLIFORMIS.—SYN. : *Acne frontalis* seu *varioliformis* (Hebra) ; *Acné pilaire* (Bazin) ; *Impetigo rodens* (Devergie) ; *Acné à cicatrices déprimées* (Besnier and Doyon) ; *Acne necrotica* (Boeck) ; *Acne rodens* (Leloir and Vidal) ; *Acné nécrotique varioliforme* (Sabouraud).

**Etiology.**—It is perhaps rather more frequent in men, and rarely occurs before twenty-five years of age. Some patients are said to have a high colour. I can confirm Hans Hebra's observation that many patients have gastric disturbance, and it is well to search carefully for any favouring cause of the kind.

**Morbid Anatomy.**—It is generally agreed that the process is a pilo-sebaceous peri-folliculitis terminating in necrosis, on very much the same lines as in the boils. The necrosis is rapid, so that what are thought to be early lesions already shew it. Sabouraud goes farther and states there is a primary infection of a seborrhoeic plug, in which the micro-bacillus of acne encysts itself, but he adds that no one has yet seen a section of this micro-bacillary stage. After this follows the stage, described by all of

the infection by innumerable staphylococci, which he says are indistinguishable from the *Staphylococcus pyogenes*. This microbe enters the outer layers of the plug and the walls of the follicle and penetrates more deeply. It excites a dense, round-celled infiltration about the hair follicle, generally above the sebaceous glands, and according to Fordyce these glands may be free or only occasionally surrounded by the inflammatory process. The sweat glands are not affected. The inflammation is prone to spread laterally and upwards. The outer root-sheath becomes implicated and disorganised, and finally the whole wall of the follicle is affected. There may be vascular stasis and some haemorrhage. According to Dubreuilh necrosis may be confined to the epidermis and then to the upper part only, or it may extend to the dermis. With the lanugo hairs on the face the lesions are comparatively superficial.

**Symptoms.**—It is an eruption with special sites of predilection, occurring in adults and sometimes in mature age, characterised by disseminated monomorphic acneiform lesions in various stages of evolution and involution, disseminated (Kaposi says grouped) over apparently healthy skin, and very often leaving varioliform scars, which may form a prominent feature in the picture. Its course is marked by long persistence, with constant evolution of the lesions, or by successive outbreaks with varying periods of calm. The sites of predilection are the temples, the forehead along the borders of the scalp, and on the scalp sometimes extensively, on the neck, the ear, and post-auricular region. It may spread all over the forehead, cheeks, beard region, nose and in the nostrils, on the front of the scalp, or nearly all over. It may be seen less frequently on the upper part of the trunk, especially over the scapular and sternal regions; and here the lesions may be unusually large and leave a corresponding amount of scarring. The limbs are very exceptionally attacked. Further, the eruption may be localised to a limited region such as the temples, upper part of the forehead, or nose, but generally is more widespread. It is bilateral on corresponding parts. There may be some irritation of the related lymphatic glands.

The elementary lesion is characterised by the formation of a pale or slightly reddened, round or oval, flat and slightly projecting papule or papulo-nodule about the size of a lentil on the face, and accompanied by a little itching and heat. They may, like some prurigo papules, be better felt than seen, and Sabouraud describes the elementary lesion as a vesico-pustule; and a pustule is noticeable in some of the published portraits, but is probably of secondary formation. In another place Sabouraud says that it is oedema, and not a true vesicle, but he describes it as formed about the follicle, and so umbilicated. It does not rupture; its contents get clouded, and it dries into a crust which gets darker, finally brown, and sinks into the skin. Other writers, who do not describe this vesicle, state that in a few hours the papule acquires a central yellowish tint suggesting pus, then a crust forms, gets drier, harder, and dark, and sinks characteristically in part below the level of the skin, for the reason that beneath the adherent crust an acute necrosis has already

occurred to a varying depth and size. Finally, the crust including the necrosed tissue separates, and a crater is exposed and becomes healed over with new epidermis, and a varioliform scar forms if the lesion is deep enough, which unfortunately it frequently is. The clinical signs of inflammation are curiously enough little pronounced, but there may be some suppuration, and ulceration with impetiginous crusts has been recorded. In the scalp the lesions, as in other affections, are very apt to form pustules and crusts. Sabouraud describes the occasional formation of secondary vesico-pustulation around the crust in certain sites, such as the scalp and the ear.

**Diagnosis.**—Its proper symptoms comprising the elementary lesions with the rapid onset of necrosis and frequent termination in varioliform scars, the constant regional localisation, its chronic and relapsing course make up a very distinctive picture. There may, however, be some difficulties in arriving at a diagnosis; years ago the differentiation from a relapsing acneiform syphilide was always regarded as a nice point. I was recently puzzled for a time by a man who had undoubtedly had syphilis a short while before and came with a characteristic recurrent localised syphilide on his arm, which was readily cured by antisyphilitic treatment, and also a somewhat superficial acne varioliformis of the forehead and some other parts of the face, and the whole of the scalp, on which the antisyphilitic remedies did not have any effect, but which yielded to simple ointments when his dyspepsia was cured. The other eruptions giving trouble are the papulo-nodular acneiform tuberculides recorded under such names as acnitis, acne agminata, and so on. It is difficult to indicate the special differences, but experience generally settles the question.

**Treatment.**—According to Sabouraud the only way of preventing recurrences is to exterminate the fatty micro-bacillary seborrhoea by the repeated use of peeling applications. The question of the patient's general health should be carefully considered, and any adjuvant factors such as dyspepsia. Locally, simple ointments are in vogue, such as dilute ammoniated mercury ointment, resorcin and salicylic acid, of each 3 grams to 30 of vaseline, calomel in small quantities with zinc oxide and vaseline, or calomel with sulphur and resorcin, and for the scalp pyrogallic acid with or without sulphur.

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CHLOR-ACNE—SYN.: *L'Acné chlorique*—**History.**—This remarkable eruption was described by Herxheimer in 1899, and in the same year Thibierge in Paris shewed a case under the name *Acné comédon généralisée*, and in 1900 published a study of four cases. Other examples have since been demonstrated, and papers on the subject have appeared in France and Germany.

**Etiology and Pathogeny.**—As the eruption is confined to workmen engaged in the manufacture of chlorine from sodium chloride by electrolysis, the question arises as to the part played by the chlorine vapour in the causation of the eruption. According to Sabouraud the action of the gas is not purely external; he considers that it is inhaled and then brings about a condition of the skin favourable to the incidence of the eruption. It is remarkable that the micro-bacillus is present in the comedones; in one case Thibierge found it encysted in the comedones, with a staphylococcus in the outer parts; and Sabouraud considers that the primary and secondary infections play exactly the same part here that they do on the causation of common acne.

**Morbid Anatomy.**—This is similar to that of acne vulgaris, but the cystic formation and secondary suppuration are rather special features.

**Symptoms.**—The changes in the skin are characterised by the constant formation of black-headed comedones, exactly as in common acne, with the addition of a variable amount of cystic change in the pilo-sebaceous apparatus, and of secondary peri-folliculitis as in acne vulgaris. The comedo formation is the primary feature, is always present and predominant, and is sometimes the only lesion. Their extraordinary numbers make a striking picture. These lesions occur on the face particularly, but are less developed on the hairy parts; in and about the ears; the neck, especially the sides and back; the scalp often in considerable numbers; on the trunk to a less extent, as a rule, but often on the upper part of the back, lower abdomen, and buttocks; on the genital organs copiously; on the limbs proportionally less; and on the backs of the fingers the plugs are small and resemble those of pityriasis rubra pilaris. It will be noted that the distribution may be more extensive than in ordinary acne. On hairy regions the sebum may collect into fatty crusts by confluence.

The excessive production of sebaceous material and the plugging of the follicles may lead to the formation of cysts, which are more or less superficial or in the sebaceous glands, and may be associated with suppuration. There may also be some peri-follicular inflammation at different depths, thus producing the papular and pustular forms of acne; deep lesions sometimes appear to arise from suppuration of the cystic glands.

The eruption generally starts on the face and extends downwards, reaching its height in some weeks, and then its duration is prolonged. The face is often swollen. There are no constitutional symptoms proper to the evolution. When these men give up their special occupation a restoration to the normal occurs spontaneously after a time.

**Diagnosis.**—It differs in no way from acne vulgaris, except in the profusion of comedo formation, its tendency to wider distribution, and the special element in the etiology.

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### COMEDONES OTHER THAN THOSE OF ACNE

It will be convenient to add a note here of the formation of comedones and sometimes secondary peri-folliculitis occurring apart from the acne of puberty. Such comedones belong to several groups.

**Comedones of Children**—*History.*—In May 1882 I saw two brothers, aged respectively seven and five years, with comedones, and my attention thus attracted, I found that the condition was not uncommon at the Children's Hospitals to which I was attached. In March 1883 I exhibited a characteristic case at the Dermatological Society of London, and later cases were shewn by Sir Stephen Mackenzie and others, and Radcliffe Crocker and Julius Caesar published interesting communications. In 1888 I had seen more than 40 cases.

*Etiology.*—I have not been able to associate this eruption with any one condition of ill-health. It is seen in the fair and dark, in the delicate and apparently robust, but many of these cases come to hospitals for advice about some constitutional condition. In four cases in members of different families the eruption was concurrent with alopecia areata, and either grouped on the bald patches or in the periphery.

The cause is most obscure. There are some points in favour of contagion, but the evidence is not so strong as in molluscum contagiosum. The comedones are composed of corneous cells, but the acne bacillus has not been found. Mr. S. G. Shattock cultivated a micrococcus, and Drs. MacLeod and Leatham a *Staphylococcus albus.* Dr. Adamson says the bottle bacillus can be demonstrated in abundance, but Dr. Whitfield did not find any organism. External irritation has been suggested, for example by hot caps, but irritants of this sort do not set up comedones. This eruption demands a thorough investigation.

Though, as a rule, isolated cases occur, it is remarkable that several children of a family may be affected simultaneously, and not in succession on reaching a certain age as with acne vulgaris. In two families I have seen three children affected, aged respectively 4, 5, 11 years, and 6, 3, and 2 years. Caesar observed it in six children of a family. Both Caesar and I failed to trace it in schools.

Age.—I have seen it in a child one year old and in boys of twelve and fourteen years, and I believe also as late as seventeen years. Of 36 of my cases 25 occurred in and between the fifth and ninth years, and 16 in and between the fifth and seventh years.

Sex.—There is a marked incidence in favour of boys.

I believe that the incidence of the comedones is highest from March to July inclusive, and that they tend to disappear in the winter, but may reappear in spring or summer. Their evolution may be gradual, but occasionally is sudden, and they sometimes disappear and return in a few weeks.

*Symptoms.*—The striking feature is the formation of comedones indistinguishable in appearance from those seen later as a stage of acne vulgaris. They usually appear on each side of the forehead close to the scalp. Then neighbouring follicles, or at a distance, become plugged; groups form which tend to enlarge until they meet in the centre of the forehead. They thus come to occupy the upper third, or nearly the half, and in rare instances the whole, of the forehead. In many cases they form on the temples, and thence spread progressively down in front of the ear, or a separate group forms in the latter site and tends to join the patch on the temple.

In the hairy scalp they also extend to a variable distance; in ordinary cases over the anterior quarter or third, but occasionally back to the level of the posterior fontanelle; and aggregations may sometimes be seen over the occiput and the post-auricular regions. Variations occur: I have seen a few in the ear lobes, between the eyebrows, at the angles of the mouth, and over the malar bones. There is always the tendency to aggregation and implication of all the follicles in a locality. Inflammation occurs now and then about these follicles, producing acneiform papules and pustules varying in number and degree, but generally little marked.

*Treatment.*—This is simple. The plugs are easily extracted, and their removal is facilitated and reformation hindered by thoroughly shampooing the part with soap and water, and by the application of slightly stimulating and disinfectant lotions. In many cases the comedones disappear spontaneously.

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**Comedones and Pustular Peri-folliculitis of the Trunk in Infants.**—This condition is possibly a phase only of that just described, but it seems to occur mainly in infants. In this phase a region of the chest and often the shoulders become dotted with comedones which are sometimes

very closely set in the central parts. A considerable amount of papular and pustular inflammation may arise and become more or less confluent.

In one of my cases the under part of the chin was attacked, thus suggesting contamination from the eruption on the chest. I have seen it

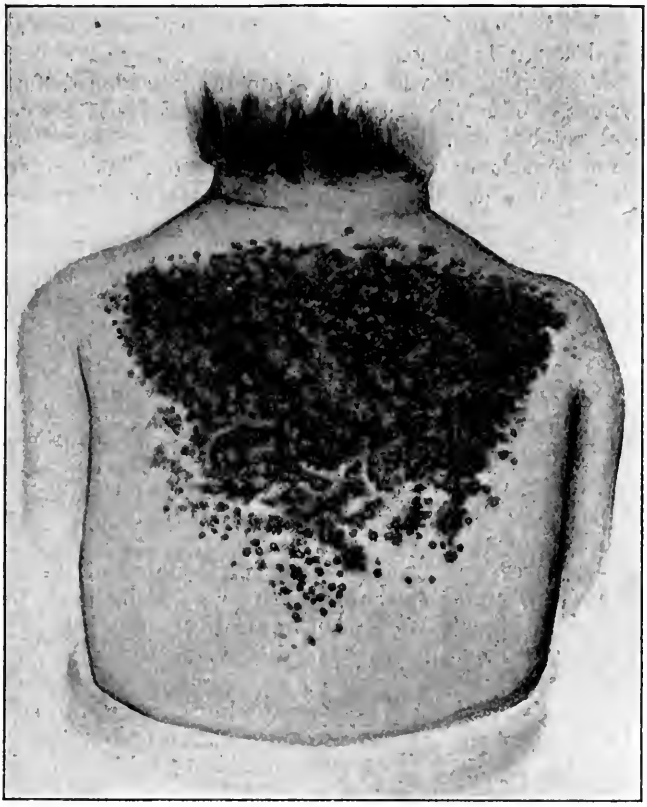

FIG. 146.—Comedones with secondary papular and pustular peri-folliculitis.

spread to the neck, and it may reach the shoulders and deltoid regions. It has been ascribed to local irritation by poultices, camphorated oil, and other liniments, for the subjects are often bronchitic or otherwise out of health. The vesico-pustular dermatitis (eczema) from turpentine and other liniments is well known, and does not excite comedones in the adult, and in my experience it does not do so in the infant. These applications, however, are very probably disposing factors.

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**Comedones in Adults apart from Acne.**—This condition should be mentioned, although its pathogeny is uncertain. Many cases are recorded of localised, grouped, or widely disseminated comedones, forming at various periods of life. Thus, I have seen a patient aged forty years with symmetrical patches over the malar prominences. Barnard noted the appearance of comedones under a belladonna plaster, but the patient was also the subject of acne. References to other cases are given below.

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## Seborrhoea

The name "seborrhoea" was formerly applied to a collection of pathological processes, which were all supposed to be essentially due to functional disorders of the sebaceous glands; but as regards many of these processes this hypothesis has been disproved, and consequently the word has now but a limited significance.

In the normal state the skin is constantly lubricated by oily substances, but not in sufficient quantity to attract ordinary notice, except in the case of negroes. The sources of these lubricants have been much discussed. It was widely believed that the sebaceous glands were almost entirely responsible. Unna argued that, as the sebaceous glands were not, like the sweat glands, under special vascular and nervous influences, there was only a steady and moderate production of sebum, which furnished a lubricant for the hairs. At the International Medical Congress of 1881 he upheld the view that the lubrication of the skin was chiefly due to the sweat secretion, which is a mixed fluid usually derived from several sources. Later he reaffirmed this contention, and set forth striking evidence that the sweat contained oil. He adopted Henle's view that the sweat glands, as a whole, secrete fat, and sometimes also watery sweat without fat. He said, "It is irrefutable that the ordinary sweat glands in man secrete fat, which at any time can be proved both on sections of the skin and in sweat of the hands by means of treatment by osmic acid—a fat which, though similar to that of the sebaceous glands,

is different from it as stearic acid and margaric acid are from oleic acid." He attributes a wide importance to the oil of the sweat glands. Although it is generally acknowledged that some oil is produced in the coil glands, some observers consider that the amount is very slight, and many hesitate to believe that the skin is chiefly lubricated from this source and in sufficient quantity to form a greasy coating. Meissner said that the sweat oil might appear at the mouth of the follicles on the palm as shining droplets, and Unna extends this view so as to make the so-called seborrhoea oleosa a hyperidrosis oleosa. He also describes the diffusion of the oil through the dermis and epithelium, thus taking a chief part in the lubrication of the skin. He described this condition as a feature of the group of eruptions he collected under the heading of eczema seborrhoeicum. This presence of oil in the epithelium is attributed by others to a special formation associated with the cornification of the upper epithelial layers; and Sabouraud speaks of the corneous cells as a keratin sac containing a drop of oil (*vide* also p. 633).

The name seborrhoea, or more correctly steatorrhoea (E. Wilson), signifies, when strictly defined, an increased output of sebum from the sebaceous glands. Unna pointed out in his historical survey that the term was first used by Fuchs of Göttingen in 1840 to denote the state in which the sebum became visible and made the skin greasy. It is the Flux sebaceus of Rayer, and the Seborrhoea oleosa of Hebra. It was thought that the oil might set in drying, but according to Unna this is impossible. Yet we may note the formation of cerumen by the glands of the external auditory meatus. There is some difference of opinion as to the exact method of its formation, but the practical point is in what forms the sebum can be extruded. On the hypothesis that there might be a qualitative alteration with unruptured sebaceous cells was founded the clinical distinction between seborrhoea oleosa and the so-called scaly and crusted seborrhoea, which could plug the follicles with fatty cells. Under the influence of this conception a number of pathological states were ascribed to disordered formation of sebum, such as the smegma of the prepuce, pityriasis tabescentium, and a congenital ichthyosis sebacea. It has, however, been shewn that the cells in these conditions are mainly epithelial.

The distribution of the sebaceous glands has an important bearing on this subject. They are widely disseminated, and mostly appear as annexes of the hair follicles. They may be of various sizes, unilobar, bilobar, or multilobar. Those of the downy hairs on the limbs and abdomen are nearly rudimentary, but on the upper trunk they are notably greater. On the face, especially on the nose and neighbouring cheeks, and on the external genitals, they are very large. The glands in the region of the beard are greater than those on the scalp. The prepuce and labia minora have glands without hairs. The Meibomian glands of the eyelashes are sebaceous, and the glands of the external auditory meatus, although of sweat type, form cerumen. Generally speaking, the sebaceous glands are larger near the vertical mid-line of the body, especially over the centre of

the forehead, the vertex, the nucha, the interscapular and intermammary regions, the sacrum, and around the umbilicus. Thus it appears that the oil is not produced with equal activity on all parts of the body. Arnozan by a special method, and the results were confirmed by Hallopeau, shewed that normally sebum is abundant in the following regions: the scalp, forehead, the nose and neighbouring parts, the front of the sternum, the interscapular region, the pubes, and the inguinal regions.

Under the heading of seborrhoea there is then one condition only left to describe, namely, an increased output of sebum; and even here disputes arise It is especially with the advent of puberty that the skin becomes greasy, more particularly on the face, as has been pointed out in the article on acne (p. 672). This excessive output of sebum is responsible for a peculiar sallow tint of the skin. On close observation every pilo-sebaceous follicle is seen to be occupied by a fatty plug, which can be squeezed out, and in fact is constantly being extruded. It dissolves practically entirely in ether. It is, I think, fully proved that these plugs are in the pilo-sebaceous follicles, but Unna holds that it is a hyperidrosis oleosa. In these plugs, which are not fixed, a micro-bacillus is found, and then the question arises if this organism is pathogenetic, and if so to what extent (see p. 6). Sabouraud believes that it causes the seborrhoea, others that it merely finds there a favourable soil. This seborrhoea has therefore been accounted for by stimulation of the sebaceous glands by toxins formed by the genital organs at this epoch, or by an excessive fatty diet, and the results of some feeding experiments on animals support this latter hypothesis. In the evolution of the epithelial plugs known as comedones the follicles become plugged and no longer permit the passage of sebum, and the face and other regions get less greasy. Rare cases have been described under the name *seborrhoea*, in which localised fatty crusts form and acquire a conspicuous yellow (seborrhoea flavescens) or dark colour (seborrhoea nigricans, *vide* p. 642), but their exact nature requires further research.

Lastly, reference may be made to the vexed question of the well-known *vernix caseosa* of infants in intra-uterine life and at birth. The prevalent view was that this coating of the infant in utero, whatever its source, served to protect the delicate skin from the macerating action of the liquor amnii. Jacquet and Rondeau, after an examination of 287 cases, contest this view, for they found the vernix caseosa insufficient to effect this purpose in 51 per cent of the cases. The main sites of its localisation are those of the chief lanugo-hair formation, but other parts remain healthy. It is seen on the back along the central furrow, on the shoulders and lumbo-sacral region, the eyebrows, ears, inguinal and axillary folds, and the palmar and plantar regions. Its consistence may be thin and loose, or thick and sticky. Histologically it was found to consist of: (1) very numerous cells, usually of the epidermic type; (2) free fat; (3) lanugo hairs found in considerable numbers in the removed vernix, and in sections of skin covered by the vernix caseosa; the debris of hairs forms in places a regular matting over the skin. Jacquet and

Rondeau see in these facts evidence of a great activity in the pilo-sebaceous apparatus in the fetus, and this is supported by the presence from the seventh month of what the authors call *miliary sebaceous acne*, usually on the face and sometimes on other parts except the palms and soles. These lesions are minute, pearl-like deposits, sometimes with a red base. They can be extruded as minute filaments of sebum, and may form again until the fifth day after birth, when this activity of formation ceases. Some of these lesions may be larger and contain a tiny hair in the centre. Histologically there are sebaceous ducts distended with sebum. These authors suggest that this passing lanugo-hair development may be an atavistic phenomenon. They found a marked pathological family history in 60 per cent of the infants with notable vernix caseosa and a normal family history in the remaining 40 per cent. These authors also bring forward as evidence of the sebaceous origin (1) the histological character of the cells in the vernix, though I do not find any direct statement that they are the cells of sebaceous glands; (2) the histo-chemical reaction with osmic acid and other reagents; (3) the chemical analysis, in that ether only dissolves traces of fatty matter, which is attributed to the presence of much water, because when the water is evaporated the ether dissolves out much fat, for the vernix is a very fatty body in composition analogous to wool-fat and very nearly allied to the sebum of the adult human being. Further sections stained with osmic acid shewed grease in the surface of the skin, in the pilo-sebaceous follicles and glands, but no micro-bacillus. Dr. Wallace Beatty in 1893 made a histological examination of a new-born infant, whose scalp was covered at birth with what he regarded as vernix caseosa. Sections stained with osmic acid convinced him that the fatty covering was derived from the sebaceous glands, for the vernix was blackened and continuous with the fat filling the hair follicles and sebaceous glands. The sweat apparatus was unaffected. Sabouraud keenly criticised the conclusion of Jacquet and Rondeau. He contended that the greater part of the vernix was not of sebaceous gland origin, but due to corneous cell exfoliation, with a little special fat, and that the fat found could not be differentiated from that found in the horn cells. The pearly little masses seen were milium, and the sebaceous nature required demonstration. Unna's hypothesis of a hyperidrosis oleosa has not received support.

The **treatment** in the adult consists locally in bathing the parts in warm water to which alkalis may be added, in then kneading region by region with a soap composed of liquor ammon. fort. ℥x.-xxx., ether ʒj., and soft soap to ℥j., then in extruding the plugs by squeezing with guarded finger-nails, and finally in the application of a parasiticide lotion, such as one of sulphur or perchloride of mercury. Some recommend abstention from fatty food, and a correction of any disorder of the digestion or of the genital organs, or anaemia. Some women often complain of greasy hair, but the cause is not entirely clear.

T. Colcott Fox.

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T. C. F.

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# MILIUM

Synonym.—*Grutum.*

By H. G. Adamson, M.D., F.R.C.P.

**Definition.**—Milia are small whitish opaque non-inflammatory bodies, which occur upon the upper parts of the face, situated in the corium and projecting above the level of the epidermis.

Following Hebra's account of this affection, most textbooks describe it as a disease of the sebaceous glands. For the eruption to which the name is generally applied this is inaccurate, and only the so-called milium of infants (strophulus albidus of Willan, Fig. 147), and certain milium-like bodies on the genitals of both sexes are probably of sebaceous gland origin. Some writers include under this title the epidermic cysts which occur in association with old pemphigus scars, lesions of epidermolysis bullosa, Fordyce's disease, the so-called congenital milium, and milium-like bodies arising in benign cystic epithelioma.

**Pathology.**—The various affections which have been included under the name of milium fall, according to their pathological features, into

two main classes, namely, horny cysts derived from the epidermis or from the wall of the hair follicles and true sebaceous gland cysts.

Milium, as defined above, is a true horny cyst, and has no connexion with the sebaceous glands. Histologically it is a cyst-like structure, with a wall composed of two or more layers of somewhat flattened-out epithelial cells, and containing a few loose, dry, horny cells in concentric layers, but no fat. It lies in the upper part of the corium, and may appear to be unconnected with the epidermis or other epidermic structures. Unna

FIG. 147.—Strophulus albidus. This is probably not true milium, but an affection of the sebaceous glands (from a coloured plate in Willan's *Atlas*, published in 1808.)

says, however, that around and connected with every horny cyst there are to be found compressed remnants of the small lanugo hair follicle from which it was originally derived, and Hebra's view, that milium arises from a lobe of a sebaceous gland, has been demonstrated to be incorrect. According to Unna, Virchow, who first investigated the morbid anatomy of milium, correctly ascribed it to the accumulation of horny cells in the deeper parts of very short lanugo hair follicles. Unna states that the horny cyst is derived from the upper part of the lanugo hair follicle, and Robinson's drawing of an early milium or horny cyst strongly supports this view (Fig. 149). Robinson considers that in the majority of cases milium arises from the root-sheath of a hair,

but that it may also be the result of misplaced embryonic rudiments from the follicle or epidermis.

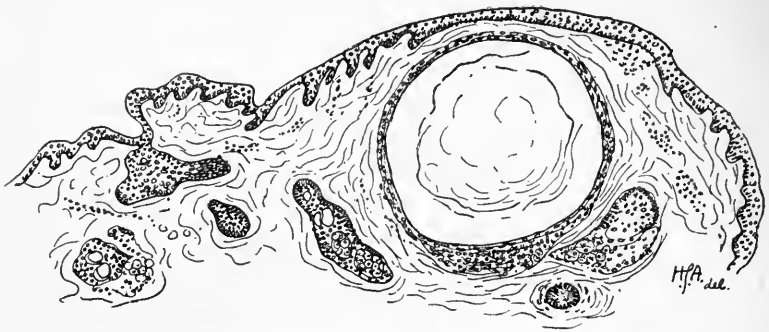

FIG. 148.—From a section of milium of the face, kindly lent by Mr. J. E. R. McDonagh. The cyst wall consists of 2 to 3 layers of flattened epithelial cells. It is not possible to trace the origin of the cyst, though the thicker portion of the cyst wall at its lower part suggests that it has arisen from a hair follicle rather than from a sweat duct.

The milium-like bodies which occur upon the penis and upon the vulva, and the so-called milium of infants (strophulus albidus of Willan)

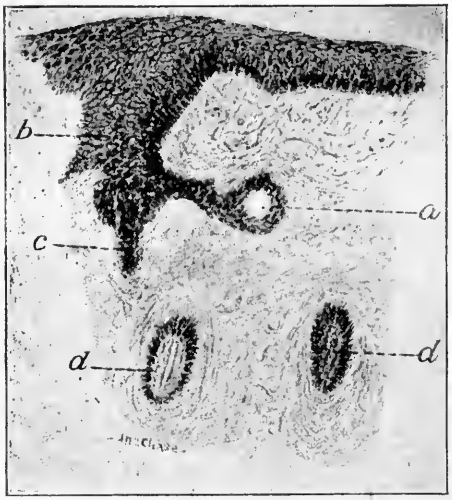


FIG. 149.—Early stage of milium formation from outer root-sheath of the hair follicle. From a case in which the lesions were numerous, situated on the cheeks, and were of recent origin. *a*, Early stage of cyst formation; *b*, upper part of hair follicle; *c*, deeper part of hair follicle; *d*, deep part of hair follicle. The outgrowth of epithelium into the corium in the formation of the milium body is well defined. (Copied, with the letterpress, from a drawing in A. R. Robinson's article on cutaneous cyst formation, *New York Med. Journ.*, 1909, lxxix. 1125.)

are said by Unna to be sebaceous cysts. Philippson describes them as sebaceous cysts produced by an accumulation of sebum in the excretory duct of a sebaceous gland, or in the infundibulum of a hair follicle, and

consisting of minute drops of fat, fatty cells of the acinus of the gland, crystals of oleic acid and cornified cells, all joined together in a more or less rounded mass. Unna says that all these structures have an opening on to the surface of the skin. Jacquet and Rondeau have examined these pseudo-milia microscopically, and have published figures shewing that they consist of enormously dilated ducts of sebaceous glands, filled with fatty secretion, and with the orifices partly obstructed by epithelial debris.

In regard to the pathology of other forms of cyst formation which may resemble milium, the "milia of scars" found in lupus, pemphigus, epidermolysis bullosa, and so forth, are also said by Unna to be sebaceous cysts. But this view does not accord with that of other observers. Darier regards these "epidermic cysts" as the result of occlusion of the sweat ducts by the scar-tissue. Dr. Colcott Fox has discussed the question of the origin of these cysts in the article on epidermolysis bullosa, and has there reproduced my drawing of a microscopical section, which appears to shew the formation of the "epidermic cysts" from small tags of epidermis which have become included in the scar (Fig. 99, p. 463).

There remains to be considered the pathology of "congenital milium," of Fordyce's disease, and of milium-like bodies in multiple rodent ulcer and in benign cystic epithelioma.

The cases described by Radcliffe Crocker as *milium congenitale*, and other examples quoted by him are probably forms of unilateral linear naevus. A somewhat similar case was published by Dr. Haldin Davis as naevus acneiformis, with a drawing by myself of a microscopical section which shewed the formation of milium-like horny cysts by the folding in of the epidermis.

In *Fordyce's disease* of the lips and mouth, the milium-like bodies which occur on the vermilion of the lips and on the mucous membrane of the mouth along the lines of the teeth are said to be moderately developed sebaceous glands.

In Dr. Brooke's *multiple benign cystic epithelioma* and in rodent ulcer, especially when multiple, there also occur milium-like bodies which are cysts formed from included epithelium and not sebaceous gland cysts.

**Symptoms.**—Only the true milium of the face will be here described. The features of the various pseudo-milia have been sufficiently indicated above, or they are dealt with elsewhere in this volume. A slight degree of the condition to which the name milium is, strictly speaking, applied is common. From one to several milium bodies may often be noticed in persons who are seen for other complaints. But less often the milia are so numerous as to attract attention at once. They are seen chiefly on the eyelids and on the adjacent parts of the forehead, temples, and cheeks. Usually the milia are pin-head sized or smaller, but they may be as large as hemp seeds, and sometimes small masses are formed by the close grouping of many milia. The milia are smooth, rounded, opaque white elevations without any opening on to the surface and

without any inflammatory areola. On scratching through the thin layer of epidermis which covers them, they may be shelled out easily as

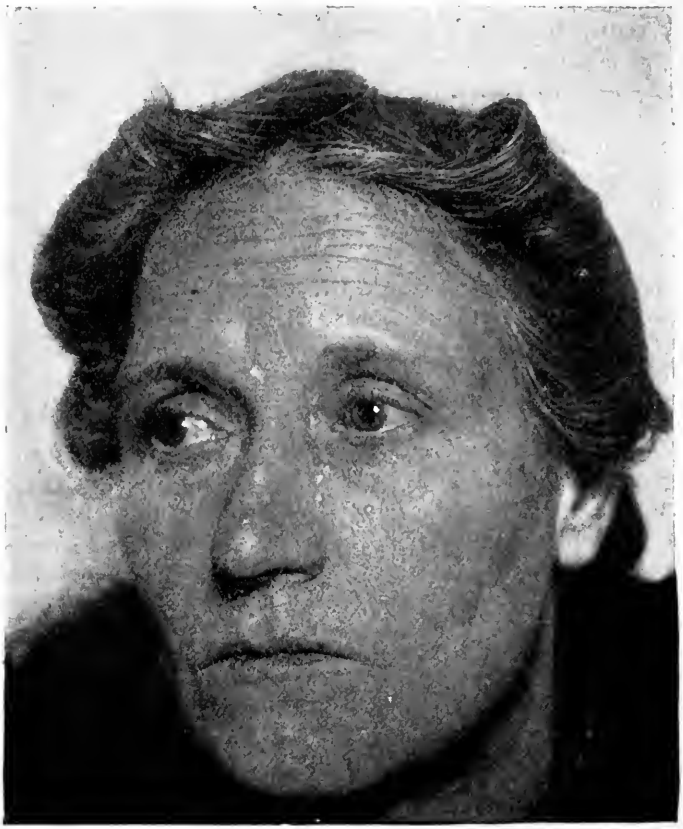

FIG. 150.—Milium. The opaque white milium bodies had been present as long as the patient could remember.

spherical white bodies, which, when crushed upon a slide and examined in liquor potassae, are found to be made of flattened epithelial cells.

**Treatment.**—If any treatment be required for this condition, the milia may be incised and enucleated.

H. G. ADAMSON.

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H. G. A.

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## COLLOID MILIUM

SYNONYMS.—*Colloid Degeneration of the Skin; Colloid Pseudo-Milium.*

By H. G. ADAMSON, M.D., F.R.C.P.

COLLOID milium or colloid degeneration of the skin occurs mainly in elderly persons who have been much exposed to the weather. It consists of small yellowish translucent nodules in the skin of the upper parts of the face and of the backs of the hands, which result from a colloid degeneration of the connective-tissue fibres in the corium.

It was first described by Wagner, in 1866, under the name of colloid milium. Balzer, who examined Besnier's case in 1879, shewed that it was not a disease of the sebaceous glands, as Wagner had supposed, and Besnier described it as a colloid degeneration of the skin. The disease appears to be rare, for less than a dozen cases have been recorded. Besides Wagner's case, examples have been reported by Besnier (1879), Feulard (1885), Perrin (1892), Jarisch (1894), Pellizzari (1890), La Mensa (1899), C. J. White (1902), and 2 cases by Bosellini (1906). Dr. R. Liveing also described 3 cases, which, in the absence of histological examination, remain doubtful; and J. F. Payne briefly mentioned a case under his care. A case exhibited by G. H. Fox, in America, as colloid milium was afterwards shewn to be a papulo-necrotic tuberculide.

**Etiology.**—The affection has been noted mainly in men of forty-five years of age and upwards who have been much exposed to the weather. It has been suggested that it is of the nature of a senile degeneration, and Balzer is inclined to the view that the local action of the sun's rays plays a large part in the production of the changes in the tissues. In 1906 Bosellini reported two cases in brothers, aged nine and twelve years respectively, who had not been unduly exposed to the weather. He regards it as a dystrophy of unknown cause, and rejects the view that it is a senile degeneration.

**Pathology.**—Balzer, who investigated Besnier's case and, subsequently, Feulard's case, found changes in the cutis in the form of "colloid" degeneration of the bundles of fibrous tissue. The place of the fibrous tissue is taken by "compact voluminous masses of a structureless substance." Towards the margin of the nodule the connective-tissue fibres shew only slight infiltration with colloid material, which appears red and shining in sections stained with picro-carmine. At the central

part of the lesion the fibres are wholly replaced by colloidal masses which take a deep orange stain. Balzer also described colloid degeneration in the outer coats of the vessels. In Feulard's case Balzer found a fragmentation of the elastic fibres at the site of the colloid degeneration, and subsequent writers have confirmed the observation that the elastic fibres take part in the formation of the colloid material. The mass of colloid material causes a projection towards the skin, which stretches and leads to atrophy of the overlying epidermis. The epidermis may eventually give way, so that the mass escapes, or the mass may be shelled out, leaving a cavity in the cutis. There may be some slight cell-infiltration around the nodule, but this is secondary to the irritation caused by the presence of the colloidal mass. Philippson's view that colloid degeneration, hidradenoma of Darier and Jacquet, and milium are varieties of one form of tumour is not accepted by other observers.

**Clinical Picture.**—The affection consists of multiple elevations or nodules varying in size from that of a millet seed to that of a hemp seed, with a smooth surface of lemon-yellow colour, transparent, hard to the touch, and situated on the face and sometimes also upon the backs of the hands. On the face they are especially found on the cheeks, the parts around the eyes, and the bridge of the nose. The ocular conjunctiva has been involved in several cases. The lesions may be grouped, but are never confluent. There are not any local subjective symptoms. In 2 cases there were headaches. On puncture these nodules, which have the appearance of containing fluid, yield only a drop of blood, and on squeezing a gelatinous-looking mass can be expressed. After reaching a certain size the nodules cease to grow and may remain indefinitely, but some may eventually break through the epidermis and be cast off, leaving only a fine atrophic scar. Generally the whole skin is diffusely pigmented, and especially on those parts which have been exposed. At their acme the lesions may acquire a reddish tinge from the presence of small blood-vessels immediately around them.

**Diagnosis.**—From their yellow appearance the nodules somewhat resemble xanthoma, but they are distinguished by their translucent appearance. From hidrocystoma they differ in that the lesions of the latter are not yellow and contain fluid which escapes on puncture. From benign cystic epithelioma a histological examination might be necessary for distinction, but the absence of the yellow colour would again help in the diagnosis.

**Treatment.**—The methods of treatment which have been employed or suggested are, curetting with a sharp spoon, when the lesion easily shells out, and electrolysis.

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## ROSACEA

SYNONYMS.—*Acne Rosacea; Acne Erythematosa; Gutta Rosea; Acné rosée; Couperose.*

By WILFRID FOX, M.D., M.R.C.P.

**Definition.**—A temporary angioneurotic flushing of the central region of the face, proceeding gradually to a permanent redness, accompanied by dilatation of the blood-vessels, stasis, and secondary inflammation of the sebaceous glands.

**Etiology.**—The disease is five times as common in women as in men. This may be accounted for by the tight clothing worn by women round the abdomen, chest, and neck, which tends to produce hyperæmia of the face; and also because during menstruation, and more especially at the menopause, vasomotor disturbances occur which cause reflex flushings of the face. The onset of the disease is usually in middle life, between twenty-five and fifty-five. The extremes are a case mentioned by Comby of a child of three, who was given cider and water to drink, and a patient of Bulkley's aged eighty-four.

In the vast majority of cases the primary reflex nervous hyperaemia derives its impulse from the digestive organs or the uterus. Nearly all the patients complain of some form of dyspepsia, which at first is usually intermittent and due to some indiscretion in diet, especially mushrooms, pork, pastry, muffins, buttered toast, pepper, cheese, and seed fruits, particularly strawberries. The question of alcohol is of the greatest importance at all stages of the disease; and although, of course, the condition is seen in lifelong abstainers, many of those who are most positive

on this point only date their abstinence from a few weeks previously, and became teetotalers because their previous excesses had produced the disease. The heavier wines, spirits, and the half-fermented liquors are, as a rule, the most potent in producing this condition. Strong black coffee and, to a less extent, tea are also frequent causes.

Other factors which frequently play a part in producing this disease are exposure to extreme heat and cold, especially sudden changes of temperature. For this reason cabmen and bus-drivers are frequent sufferers, coming as they do from the hot atmosphere of a public-house, where they have probably been partaking freely, into cold east wind.

Local inflammatory conditions inside the nose, such as rhinitis or polypi, may lead to hyperaemia externally. The continued use of inappropriate cosmetics may irritate a delicate skin, and assist in making the condition worse. Ophthalmic surgeons, as well as dermatologists, have noticed the frequent combination of chronic blepharitis and rosacea, although it is difficult to say which is primary. Unsuitable glasses may also produce redness of the face. There are in addition certain general conditions of the heart and kidneys which produce dilated blood-vessels on the nose and cheeks, and diffuse red flushings. These are very important from the point of view of prognosis, and are often overlooked in considering the local conditions. Constipation is a frequent cause of alterations in blood-pressure and flushing of the face.

No organism has been proved to be the true cause of this disease, although many have been described. The most important organism, especially in the later stages, when seborrhoea in one form or another is always present, is the micro-bacillus of Sabouraud (*vide* p. 6). It must not be forgotten that even in persons not primarily seborrhoeic, engorgement of the nose due to dyspepsia, and more particularly alcoholic dyspepsia, is apt to produce enlargement of the sebaceous glands, and favours the growth of this bacillus.

**Pathogeny.**—The disease is primarily a reflex angioneurotic flushing of the face, the continued repetition of which eventually produces permanent damage of the blood-vessels; on this seborrhoeic and pyogenetic lesions are grafted later. The sequence is exactly the reverse of that in acne vulgaris, in which the earliest change is the hypertrophy of the sebaceous glands followed by pustulation, which causes the inflammatory redness around.

**Histology.** — The early stages simply shew dilated blood-vessels especially those deep in the corium; later, all the vessels are affected, and their walls become thickened and tortuous. The dilated vessels around the hair follicles exude lymphoid cells, and thus produce what Thibierge describes as an ordinary peri-folliculitis. Unna speaks of the disease as being developed from single lentil-sized seborrhoeic spots.

In rhinophyma, a name given by Hebra to the hypertrophic variety, the sebaceous glands are enormously developed, and there is in addition a great increase in the fibrous tissue. Under the microscope the enlarged glands are seen surrounded by coarse masses of collagen bundles, in

the meshes of which are a large number of mast cells, whose presence bears witness to the oedema and boggy condition of the tissues. This increase of fibrous tissue in association with large suppurating sebaceous glands is similar to the acne cheloid on the back of the neck in fat, alcoholic, seborrhoeic individuals. The fibrous tissue obstructs further the sebaceous ducts, renders the outflow more difficult, and by stagnation favours additional pustulation, which in its turn produces fresh fibrous tissue, and so a vicious circle is set up. The mechanical plugging of the lymphatics, due to repeated suppurative lymphangitis, is also of importance in producing the general boggy, sodden condition of the tissues.

**Clinical Description.**—The first symptom is periodic flushing of the face, associated with a feeling of warmth and "blood running to the face." This comes on, as a rule, just after a meal, especially the evening meal, or after sudden exposure to either heat or cold. The redness is usually more frequent at the menstrual periods, and also at the menopause, and is often then noticed for the first time. These flushings are at first confined to the nose and adjacent parts of the cheeks, but later they extend on to the forehead and on to the chin. At first they last for a time, varying from a few minutes to a few hours, the colour at this stage being easily removed by pressure. This initial stage may continue for several months, or more often years, the progress depending chiefly on the care taken by the patient. Gradually the redness loses its bright colour and becomes deeper in shade, the burning sensation is more intense, and the attacks last longer and occur more frequently.

Dyspepsia, which is frequently not noticed in the early stages, now becomes evident, and increases in severity. As a rule, a feeling of distension and general discomfort is complained of, rather than actual pain; this is particularly the case in women who wear tight corsets. This dyspepsia is at first noticed only after eating certain indigestible articles of food. The part played by alcohol and coffee has also been referred to; and the rapidity and progress of the disease depend perhaps more on their use and abuse than on any other factor. The appearance of the flushing immediately after drinking alcohol or coffee shews that vasomotor disturbance is the essential change in this disease.

The redness slowly becomes permanent, although, of course, still varying in intensity. In the midst of this redness isolated injected veins begin to appear, which at first are only temporarily dilated, but which as time goes on also become permanent. They are most often seen as bluish-purple streaks running down the nose, or as irregular stellate markings on the cheeks.

At this point, however, the disease, which has so far presented a uniform course, may follow one of the four following clinical forms:—(1) This purely congestive condition becomes permanent and does not progress further; for this Thibierge reserves the name "couperose." (2) Papules arise, producing a mixture of congestion, telangiectases, and acne-like papules. (3) The condition becomes hypertrophic; rhinophyma. (4) More rarely there is a miliary eruption, called rosacea acuminata by

Crocker. This is Brocq's classification, which certainly has the advantage of including all the clinical forms.

(1) The *couperose form* is the one most often seen in women, and in thin men with chronic dyspepsia. There are no papules, only permanent diffuse redness with a few scattered telangiectases, which sometimes run together to form a network. The skin is shiny, and there is more or less oily seborrhoea.

(2) The *mixed form* is the commonest, and, in addition to the congestive hyperaemia, shews hard, red papules, which often ooze serum at

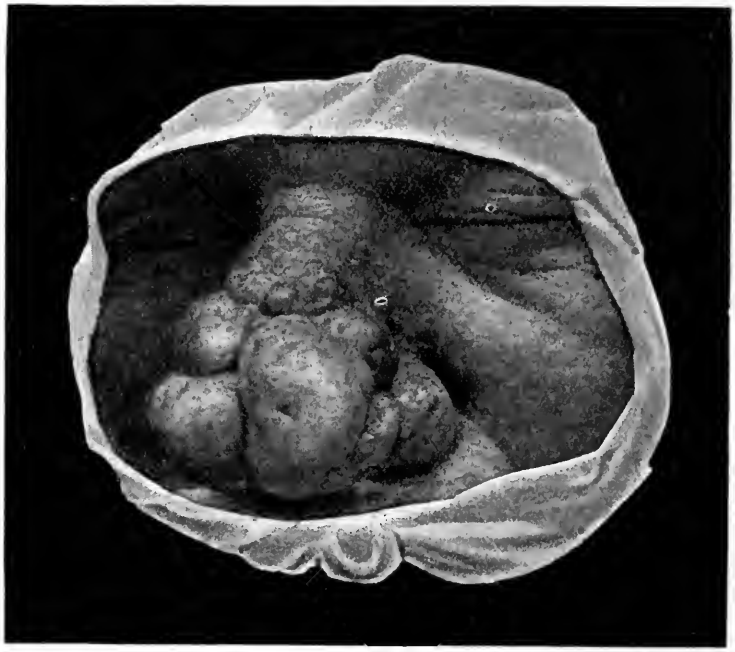

FIG. 151.—Rhinophyma (from Jacobi's Atlas (Rebmans, Ltd.)).

their summit, then become infected with pyogenetic organisms, and develop into pustules on a red base. They are often the point of origin of fresh injected veins, whilst the pustulation exaggerates the inflammation of the immediate surroundings. In women with pelvic disorders the papules are often most marked on the chin. More rarely there are papules, which are pearly-white in colour, very hard to the touch, and do not tend to suppurate. These are usually few in number, not more than two or three on the whole face. The seborrhoeic condition is usually more marked in this form.

(3) The *hypertrophic form* is usually confined to heavy drinkers, especially if they are exposed to cold in their employment, such as bus-

drivers and cabmen. In these patients the hyperaemia is passive, easily removed on pressure, and the surface is cold to the touch, the circulation being slow. The follicles on the nose become very large, and the skin coarse and greasy, resembling that of a tangerine orange. Large, flabby, soft masses grow slowly from the tip of the nose and hang down. Many of the follicles are blocked with large masses of sebaceous material, which can be squeezed out. There is, in addition to the growth of glandular and fibrous tissue, a large element of lymphatic obstruction, which is evidenced clinically by erysipelatoid attacks which resemble those seen in hypertrophy of the lips in suppurative conditions of the mouth. These masses vary in size, from that of a bean to that of a good-sized pear in a case of Crocker's. To a less degree a similar condition may be found on the cheeks at the side of the nose.

(4) Rosacea acuminata has been described independently by Brocq under the name of "éruptions papulo-pustuleuses miliaires récidivantes de la face," and by others under the names of "acné miliaire" and "acné eczématique." In this form the lesions are very small papulo-pustules, about the size of a pin's head, scattered irregularly over the face. The diffuse redness is, as a rule, not marked, but the base of each papule is bright red, and the apex, which contains a small head of sero-pus, yellowish-white. They come out in sudden crops and disappear in a few hours. They appear to be brought on more especially by exposure to cold or bright sunlight. The patient may go to bed without a single lesion and wake up with the face covered with them. This form is far commoner in women than in men.

**Differential Diagnosis.**—The disease must be differentiated from acne vulgaris, lupus erythematosus, papular syphilides, chilblains, and adenoma sebaceum.

The early age at which true *acne* starts usually makes the diagnosis easy. Acne starting at puberty is usually improving by the age of thirty, whereas rosacea generally begins about the age acne is dying out. The absence of comedones in rosacea is also of assistance, and the fact that rosacea tends to occupy the central third of the face, whereas acne prefers the outer two-thirds. The flushing after meals, or when exposed to changes of temperature, and the sequence of events—the papules and pustules coming after the flushings—are all significant of rosacea. It must not be forgotten, however, that a very large number of patients who have rosacea suffered from acne when younger, and the two diseases just merge one into the other, and run together hand in hand, previous seborrhoea making the progress of rosacea much more rapid. These cases gave rise to the original name of acne rosacea.

*Lupus erythematosus* occupies similar regions and has etiological factors in common with rosacea. It is distinguished, however, by the characteristic adherent scales and by the fine scarring which it leaves. There is absence of nodules and papules, and a much more definite edge in the latter. In a doubtful case the ears should always be examined for the typical scaliness of lupus erythematosus along the edges.

*Papular syphilides* in this region which resemble rosacea are nearly always late in the disease, and it is therefore usual to find signs or to obtain a history of previous syphilitic lesions. They are, moreover, better defined, come up quickly, and usually shew some signs of ulceration or scarring.

*Chilblains* occur over the same area, but they are always present elsewhere as well, for example, on the ears and fingers. The onset of the disease in the winter is of course significant, and chilblains shew a uniform plum-colour without papules or telangiectases; they are also more painful.

*Adenoma sebaceum* begins in childhood or early youth, and is practically confined to epileptics or mentally deficient children. The red papules occupy the same area as rosacea, but they do not suppurate, and the skin in between is normal in colour.

**Prognosis.**—The disease hardly ever undergoes spontaneous resolution, but pursues its course in one of the four ways described on pp. 698-699. Local and general treatment will, however, stop further progress in the majority of cases; but a permanent cure is rare, the patient having to exercise care in his diet, etc., for the rest of his life. In cases in which cardiac, renal, and hepatic diseases play a part in the rosacea, the outlook is not so good, and even if the dilated blood-vessels are destroyed by electrolysis, others quickly take their place.

**Treatment.**—General and local methods are both necessary. In the early stages, at any rate, general treatment is the most important. The reflex cause must be found, and, if possible, corrected; uterine and pelvic disorders should be appropriately dealt with, and gastro-intestinal dyspepsia should be treated by the recognised methods. The diet should be carefully supervised, and those articles of food eliminated which are found by experience in the particular case to cause flushings. The patient should abstain from alcohol altogether; if he must have something, the most suitable drink is hock diluted with mineral water; champagne, cider, port, burgundy, and spirits are bad; coffee, and in some cases tea, should be forbidden. Constipation should be relieved, and if this cannot be done by a suitable diet, drugs must be employed. Where the patient has always to take a purgative, cascara and aloes are best; the well-known dinner pill composed of Ext. nucis vom., ext. belladon. viridis āā gr. ½, aloin. gr. i., taken twice daily with meals, is generally efficacious. Saline waters are good temporarily, but tend to lose their effect if they have to be continued for very long. The one drug which does appear to act as a specific in some of these cases is ichthyol. It has been strongly advocated by Sir Malcolm Morris, who gives it in gr. v. doses in capsules twice daily, early in the morning and late at night, gradually increasing up to gr. x. as required. It should be continued for several weeks, until the stomach appears less irritable, and ordinary plain food can be taken. Bismuth and strychnine are also of assistance in some cases. Arsenic is useless, and frequently aggravates the dyspepsia.

Locally, the patient should avoid sitting close to a fire, should protect

the face from cold winds, especially in motoring, or from bright sunlight. Cold water should never be put on the face, and if the water is very hard, even when hot, bran should be put in the water before bathing the face.

In the early stages, when the flushings are intermittent, very little in the way of local treatment is required, a calamine lotion by day, and a mild ichthyol cream by night, made up as follows :—℞ Ichthyol gr. xv., zinci oxidi ʒvi., lanolini ʒii., ol. olivae, aq. calcis āā ʒi., M., are all that is required.

When there is any sign of seborrhoea, either early or later on in the disease, stronger measures should be taken. The three drugs which are of use are sulphur, resorcin, and mercury, and they are efficacious, as a rule, in that order. It is often remarkable what strong lotions a bright red, inflamed-looking, seborrhoeic nose will stand. The following lotion will be found suitable in most cases :—℞ Sulph. praecip., zinci sulphatis, potassii sulphidi āā ʒiss., aq. rosae ad ʒviii. ; or, if something stronger is required, Sulph. praecip. ʒss., resorcin gr. xv., spirit. rect. ad ʒi. Pustules should be opened with a small acne-spud, and the pus removed. Papules which are resistant and hard should be touched with a fine electro-cautery. Injected venules can be destroyed either by negative electrolysis, passing the needle on the negative pole along the vessel with a current of one and a half to two and a half milliamperes running, or by criss-cross scarification.

The papular and the hypertrophic forms are sometimes benefited by *x*-rays, which should, of course, be carefully given in measured doses of a three-quarter Sabouraud dose every fortnight. That is to say, the pastille should be judged by electric light and not by daylight.

Large nodules and pendulous masses should be scarified and removed wholesale, the nose being pruned down to the required shape. The islands of epidermic cells left when the sebaceous tracts are cut across act like skin-grafts and give quite good results. There is some risk of infection after the operation producing erysipelas or cellulitis, from the pustular sebaceous glands, which may be cut across, and also on account of the boggy and unhealthy tissues around ; it is therefore advisable to bathe the part freely with antiseptic lotions during the operation.

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W. F.

# DISEASES OF THE HAIR AND HAIR FOLLICLES

By the late H. Radcliffe Crocker, M.D., F.R.C.P.
Revised by J. M. H. MacLeod, M.D., M.R.C.P.

Alopecia.—Alopecia is the generic title for baldness in all forms; whether complete or partial, general or local. Baldness may be classified into congenital, premature—either idiopathic or symptomatic—and senile.

**Congenital Alopecia.**—This is very rare and seldom complete, the hair being usually scanty or in patches. When it does occur, it is not infrequently accompanied by concomitant defects of development of the teeth and nails. In the majority of cases in which children are born bald the alopecia is due to an arrest in development, and hairs eventually appear, though it may be several years after birth.

A comparatively slight development of the hair in all parts of the body is not uncommon, and often shews a family prevalence. In addition to true congenital alopecia circumscribed bald patches may result from the presence of non-hairy moles on the scalp, from ulceration and cicatrisation occurring in utero from amniotic adhesions, from trauma due to the employment of instruments at birth, and from hydrocephalic distension of the skull, in which case the alopecia is confined to the sutures (Dubreuilh and Petges).

**Idiopathic premature alopecia** may attack persons of any age after puberty, but is much more common in the male sex. The baldness begins in the posterior part of the vertex, and in the temples; in the latter position the hair line recedes until there is only a central crest, and this also ultimately disappears, and the whole of the top of the head is denuded, leaving only a fringe of hair of varying width below.

The loss of hair is not steadily progressive. The process may be arrested for a time, and there may be even temporary improvement; but unless persevering treatment be adopted the ultimate result is only delayed.

*Causes.*—In certain families all the male members lose their hair prematurely through many generations. Complete denudation of the regions usually affected generally takes several years, but sometimes is only a matter of months. Although family disposition certainly plays an important part, in the great majority seborrhoea is present, though it may be masked by frequent washing, or by the application of pomades. In these cases the baldness is then symptomatic, and, if the hair is to be restored, the treatment for seborrhoea must be adopted. The family proclivity is only, therefore, a local tissue proclivity favouring the invasion of seborrhoea.

**Symptomatic Premature Alopecia.**—Whilst most of the cases of apparently idiopathic baldness are really symptomatic of seborrhoea, a

larger number of cases of baldness are secondary to more obvious causes, local or constitutional. Any constitutional condition which leads to the depression of the vital powers is apt to be accompanied or followed by the falling of the hair in greater or less quantity. The most common and best recognised of these are the specific fevers, and general cachectic conditions, such as syphilis, leprosy, phthisis, diabetes mellitus, and myxœdema; or it may follow nervous depression, such as violent shock, intense or prolonged anxiety, and other depressing emotions. Local causes are extremely numerous, but the most fruitful cause, more common than all the rest put together, is chronic dry seborrhœa of the scalp, or, as some authors name it, seborrhœic eczema; although there are no clinical signs of inflammation. It occurs in both sexes and at all ages, and, if left untreated, leads to permanent baldness of the parts most affected—the vertex and temples. Most inflammatory diseases of the scalp, if the inflammation be severe enough, will lead to more or less loss of hair. Erysipelas, small-pox, eczema, and psoriasis are common examples in which the loss is often considerable, but varies with the intensity of the inflammation. In scarring lesions the follicles are destroyed, and permanent baldness therefore results; of this lupus erythematosus, morphœa, and the tertiary lesions of syphilis are good examples. Keratosis, with or without ichthyosis, leads to permanent atrophy of the follicles. Vegetable parasitic diseases may lead to permanent loss of hair, such as occurs in the cicatricial atrophy following favus; or the loss may be temporary, as in tinea tonsurans. Local injuries, such as blows, friction, or continual straining of the hair will lead to baldness, either temporary or permanent; and baldness in patches is the characteristic feature of alopecia areata.

**Treatment.**—It is obvious from the foregoing that this depends to a large extent upon the accurate diagnosis of the cause and the possibility of removing it. In morbid constitutional conditions attention to the general health is essential, and whatever means, whether medicinal, dietetic, or hygienic, will restore it to its highest degree, will be best calculated to renew the hair, though local stimulation, to increase the activity of the circulation of the scalp, is also desirable. In congenital and senile baldness treatment is of no avail. In the so-called premature baldness the treatment for seborrhœa is most likely to be successful, but, as in constitutional baldness local treatment is useful, so in local baldness constitutional treatment should be adopted if there be any indication for it in the condition of the patient; for it must be remembered that vigorous growth of hair cannot be expected unless the patient be at the highest standard of health of which he is capable.

When the disease is due to an inflammation of the skin, the hair generally grows again rapidly and vigorously on this being subdued, unless the inflammation had been very intense and suppurative. Local stimulation after this is generally contra-indicated, lest the inflammation be renewed. In parasitic diseases, such as ringworm or favus, the destruction of the parasite by means of parasiticides is an obvious indication; and loss of hair is not permanent except after such severe inflammation of the skin as

in kerion, or after prolonged pressure as in long-standing favus. Alopecia from syphilis readily responds to appropriate constitutional treatment, with the local application of mercurial preparations, such as the dilute ammoniated nitrate or perchloride of mercury ointment. The treatment for chronic seborrhoea is given, p. 687.

ALOPECIA AREATA.—SYN.: *Porrigo decalvans; Tinea decalvans; Area Celsi; Alopecia circumscripta; Pelade.*

**Definition.**—A form of baldness rapidly produced, with complete denudation of the affected parts, which begins in limited and, usually, round patches, but which, by spreading and coalescence, may affect large areas, or even the whole of the hairy system.

Under alopecia areata are comprehended at least three classes of cases: first, those in which there is universal denudation of the hair and often of the nails, generally of acute onset, and not necessarily in patches; secondly, in which there are one or more patches in the course of a nerve or in the site of an injury; and thirdly, the common form which occurs in patches or bands of irregular distribution with characteristic stumps of hair at the border of the spreading patches. The first two classes are universally admitted to be of trophoneurotic origin; the third is the subject of much dispute, many contending that it also is trophoneurotic, whilst others consider it to be of parasitic origin.

1. **Alopecia Universalis.**—This may be regarded as a malignant form of alopecia. In the worst cases the whole of the hair of the body may be swept off in a few days, together with some or all of the nails; and permanent baldness may result. This may occur without any apparent defect of health, either before or during the defluvium; but in the majority of cases there have been either severe mental or physical shocks—such as acute worry or severe fright, or injuries to the head by falls or otherwise. In these acute cases the hair does not come out in patches but in masses or by a general thinning. Where the loss is not so acute, patches may be formed resembling other cases of alopecia areata, and complete denudation is produced by the multiplication of the bald areas and their subsequent coalescence. In this form weeks or months may elapse before the baldness is complete. The nails may be deeply furrowed or pitted, but are seldom lost; and the prognosis for recovery, though still bad, is not so hopeless as in the most acute cases.

2. **Alopecia Localis seu Neuritica.**—This form includes cases in which one or more patches of baldness form at the site of an injury, or in the course of a recognisable nerve; and there can be little doubt that they are the result of a neuritis. The patches, when once formed, do not spread. They are often preceded by severe and persistent neuralgia, and may be associated with patches of white hair; not infrequently, indeed, the hair, when it grows again on the bald patches, is quite white, and it may never recover its colour. This class comprises a comparatively small number of cases.

3. **Alopecia areata** in its classical form, from which the previous

groups have recently been distinguished, comprises a very large percentage of all the alopecias in which the denudation of the affected area is complete; it constitutes from 2 to 3 per cent of all forms of skin disease in England and France, about half that number in Scotland, from ½ to 1 per cent in America, and about 1 per cent in Germany and Austria (Lassar).

This disease usually begins in the scalp, though in men it is not very uncommon in the whiskers or beard; it is comparatively rare for it to begin in other parts. The patches may be single or many. In the latter case they appear at irregular intervals, and without any particular arrangement, symmetry being unusual. Whilst the patches may form in any part of the head, they most frequently begin in men at the back part, corresponding with the line of closest contact with the hat. Each patch is primarily circular, and from a half to two inches in diameter. It spreads slowly, but, by coalescence with neighbouring patches, a large area may soon become bald; and in some instances, by a repetition of the process, the baldness may eventually become universal. In more favourable cases, after the patches have attained one or two inches in diameter, they cease to spread; and after a time restoration sets in. In some cases a complete band of baldness is formed all round the lower borders of the hair, with or without patches of the ordinary kind in the upper part. This marginal type of alopecia is the ophiasis of Celsus, and special attention has been directed to it by Sabouraud, who regarded it ("pelade ophiasique") as peculiar to infancy, and of non-microbic origin in contradistinction to the central type which he believed to be microbic. This distinction, however, does not hold good, as ophiasis may not only occur in adults, but may be associated at any age with central patches. In 119 cases of alopecia areata in adults, collected by Jacquet, 62 had central lesions only, 17 had marginal lesions, and in 40 both marginal and central patches occurred.

A bald patch in alopecia areata is perfectly smooth and abnormally white, the tissue is thinned, has lost some of its elasticity, may pit slightly on pressure, and is often slightly depressed below the surrounding surface. The affected skin is also much less sensitive to irritants which would inflame the normal skin, but do not excite any inflammation on the affected patch. So long as it is spreading at the borders, short and characteristic stumps occur usually in small numbers at the spreading edge; they are not numerous as a rule, and are shaped like a note of exclamation (!). The thickening at the free end is but apparent, as it represents the normal thickness of the shaft which is broken off short, the fine end being the atrophied root which is gradually being extruded. These truncated hairs are of practical importance for diagnosis and prognosis. They are not found in the indisputably neurotic cases; and, inasmuch as they can be pulled out almost with a touch, and drop out spontaneously a few days after their appearance, they indicate that the disease is still extending. They are usually seen on the borders only of the patch; but when the latter forms very acutely they may be

very abundant, and for the first week or two more or less all over it. The activity of the disease may also be gauged by the looseness of the apparently healthy hair round the patch, a moderate pull removing many hairs at a time.

The course of the disease varies both in extent and acuteness. In the most favourable cases there may be only one or two patches of moderate size, which may have formed without attracting the attention of the patient during the process (Fig. 152); in others the patches form very rapidly, quantities of hair coming out every morning when combed or brushed, sometimes accompanied with slight itching or some redness of the skin, but more frequently without any obvious symptoms. In the most acute cases fresh patches are continually forming and enlarging, both by peripheral extension and coalescence with their neighbours, until the whole of the scalp is denuded of hair (Fig. 153). Eyebrows and eyelashes may also be involved; this condition imparts a peculiar staring appearance and at once attracts attention; and there is often not a hair left on the face. The trunk is less frequently attacked; but the axillæ and pubes may be denuded, and in some cases even the lanugo hair of the extensor aspect of the limbs may be cleared off. In the latter instances symmetry in the process of denudation is sometimes observed, although on the scalp the absence of symmetry is equally notable, and, except in the occipital region, which is frequently the first to be attacked, the arrangement of the patches is apparently accidental. The rapid and extensive cases just described are, fortunately, the least common. As a rule the progress is gradual, many weeks or months being required for the denudation of the whole scalp; and more frequently still the activity of the disease ceases with the formation of a moderate number of patches. Sometimes, however, the apparent cessation of the activity is but temporary or partial, hair growing over some patches while fresh ones form from time to time; or, again, the hair which does grow may not be really strong, it may not get beyond the downy condition, and after a time falls off.

One of the first signs of improvement is the absence of the stumps already described; then the hair round the patches is no longer loose, and new hair begins to spring up at the periphery of the patch, or, in the most favourable cases, simultaneously over the whole area. The new hair is at first very fine and colourless, and in some cases, even in dark-haired people, may be perfectly white for some time after it is fully grown, producing a curious piebald appearance; ultimately, however, unless the patient is elderly, the pigment is perfectly restored; the pigment appears first at the root end, as might be expected. The duration of the disease is very variable; the majority of cases take from one to two years for complete recovery; some patients getting well in a few months, whilst others take several years.

**Histo-pathology.**—Sections of the bald patches including the spreading edge shew an absence of pigment in the cells of the basal layer, flattening of the papillae and of the corresponding interpapillary processes, but otherwise no definite changes in the epidermis. Atrophic changes

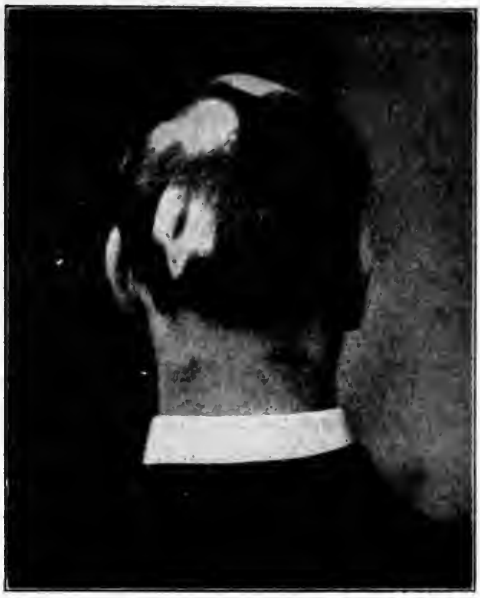

FIG. 152.—Alopecia areata.

FIG. 153.—Extensive Alopecia areata.

occur in the follicles, which are so marked in old cases that they may be reduced to mere cords of cells. The hair papillae can usually be detected, and unless the atrophic changes in the follicles are very well pronounced, lanugo hairs are generally present. At the spreading edge, where the long hairs have not broken, the hair bulb is shrivelled, the medulla has disappeared, and pigment is no longer present in the cells of the cortex. Near the mouth of the follicle splitting in the cortex may be detected, the changes in the hairs appearing to begin in the papillae and to spread up the shaft. In the hair papillae, in the peri-follicular tissue, and around the neighbouring capillaries a slight cellular infiltration may be detected, consisting of lymphocytes and a few mast cells; and occasionally in the papillae dilatation and thrombosis of the capillaries may be observed. In old cases there are definite evidences of fibromatosis in the hair papillae. The sebaceous glands are atrophied, but the sweat glands appear to be unaffected. The histological changes point to a primary implication of the papillae of the hair, leading to interference with its growth and to atrophy both of the hair and of the hair follicles.

**Etiology.**—*Age.*—The disease is most common in childhood and early adult life. It is rare under five years, most prevalent between the ages of ten and twenty, and gradually diminishes in frequency between twenty and forty-five, after which it rarely occurs, though cases are occasionally met with in elderly people.

*Sex.*—It is almost equally common in the two sexes, but is slightly more frequent in females in early life and in males after twenty.

*Social Position.*—It occurs in all ranks of society, and is equally prevalent in hospital and private practice, though it is not often encountered in the most prosperous classes.

*Season.*—The season of the year does not seem to have any bearing on the causation of the disease, though it may have some influence in determining a recurrence or regrowth. In some people there is a definite tendency for the hair to grow faster in summer, as is shewn by the necessity to have it cut more frequently and to shave more often in that season. In cases of alopecia areata regrowth takes place more readily in warm summer weather, and fresh bald patches tend to appear towards the end of autumn and in winter.

*Colour of the Hair.*—It is said to be more common in dark-haired persons than in those with fair hair, and it has even been asserted to occur exclusively in the dark-haired. This assertion is not borne out by my experience, though I am inclined to believe that it is more prevalent in dark-haired people.

*Disposing Causes.*—A number of causes have been cited as disposing to alopecia areata, such as general debilitating diseases like influenza and enteric fever; diseases of the nervous system, such as epilepsy, chorea, tabes dorsalis, paralysis, and mental disturbances; and pregnancy, and disorders of the genital organs, such as dysmenorrhoea. No precise

signification, however, can be attached to these, and their association with the disease may be accidental.

**Pathogenesis.**—The true cause and exact nature of alopecia areata are still unknown, but there are three hypotheses to be considered, namely, the microbic, trophoneurotic, and toxic, each of which seems to explain a certain number of the cases, but none of which is applicable to all. Some observers consider that there is a common cause for all cases, whilst others accept a dual or treble causation. As the problem is still a matter for controversy, it is advisable to consider the arguments in favour of each of these hypotheses.

(a) According to the *microbic hypothesis* alopecia areata is a parasitic disease due to the presence and action of a specific microbe or fungus situated in or about the hair follicles. If this were the case the disease should be contagious, capable of being inoculated from man to man, and possibly from man to the lower animals, and a pathogenetic micro-organism should be found to be invariably present. So far none of these conditions has been fulfilled, and the arguments in favour of it are based rather on clinical observation than on bacteriological proof.

Micro-organisms.—Up to the present time neither a microbe nor a fungus has been found in all cases of alopecia areata. From time to time observers have discovered micro-organisms in the follicles or about the affected hairs, such as micrococci (Thin), *Staphylococcus epidermidis albus* (Walker and Marshall-Rockwell), cocci (Vaillard and Vincent), flask-shaped bacilli (Unna), and micro-bacilli (Sabouraud); but there is no conclusive proof, experimental or accidental, that any of them is the cause of the disease. Sabouraud, one of the strongest exponents of the parasitic hypothesis, regards alopecia areata, with the exception of those cases of the marginal type or ophiasis, as acute circumscribed seborrhoea, and due to the micro-bacillus of seborrhoea (*vide* p. 6). This opinion was based on the facts that he succeeded in finding micro-bacilli in a large number of cases of the disease, and that a filtered culture of the bacillus injected into a rabbit was followed by total defluvium of the hair. Other observers, however, have not been so successful in finding micro-bacilli, except in cases in which the alopecia areata was associated with definite seborrhoea, and various other bacterial toxins when injected into lower animals have been known to produce loss of hair. Sabouraud also clearly differentiated between the central type of alopecia areata, which he believed to be due to the micro-bacillus of seborrhoea, and ophiasis of childhood, which he considered to be of unknown origin, possibly hereditary. In this country this differentiation does not hold good, as ophiasis may be found in adult life, not only as a recurrence, but as a primary lesion, and central patches frequently occur before puberty; and in not a few cases both in children and adults central and marginal lesions may occur together. It seems that there is not any essential difference between the two types of cases, and that what causes the one is in all probability responsible for the other; and the absence of seborrhoea as a rule before puberty would account for the absence of

micro-bacilli in the marginal cases in children. Seborrhoea capitis is such a common disease that it would naturally be expected to occur in a considerable number of cases of alopecia areata. Out of 207 cases of alopecia areata, Walker found seborrhoea in 140, but there is no proof that the two conditions are causally related.

On several occasions hyphomycetic fungi have been found in cases of supposed alopecia areata. These observations are not generally accepted, and the cases are believed to be examples of the so-called "bald ringworm," or "tinea decalvans," due to the *Megalosporon endothrix*, or cases in which the alopecia areata was preceded by, or coexistent with, the common small-spored ringworm.

Transmissibility.—Innumerable attempts have been made to inoculate alopecia areata on man and on dogs, rabbits, and cats, but, except in a few doubtful instances, with negative results. Jacquet made a hundred attempts to inoculate it on himself and on five of his pupils from a number of patients suffering from the disease. The inoculation experiments were carefully done by scraping patches of alopecia areata and their borders, and rubbing the scrapings into the parts of the scalp preferred by the disease, or by charging a needle with them and catheterising the hair follicles. In one of the cases inoculated there was a history of the disease seven years before. In no instance was the result of the inoculation successful.

Contagiosity.—Though in the vast majority of cases there is no evidence of contagiosity, and it is unnecessary to isolate patients suffering from the disease, still in a few cases the possibility of its having been spread by contagion has been suggested. For instance, it occasionally occurs in several members of a family, in a brother and sister, or in a parent and child. Such cases have been quoted in favour of the contagiosity of the disease, but as evidence of it they are not of great value. Alopecia areata is common, and instances in which two members of a family have been affected are very rare; if it were contagious such instances should be much more frequent. They are probably mere coincidences, or result from an hereditary disposition. Other observations have been quoted in favour of its contagiosity; for example, cases have been observed in which it occurred on the beard soon after being shaved by a barber, or on the scalp after the hair-clippers had been used. It has several times been known to appear after wearing a hired wig for theatricals. Patients not infrequently assert that they were infected from another case with which they were in contact. Epidemic outbreaks of it in schools have been reported by Hillier, Bowen, and others. Groups of cases have been observed among soldiers in barracks, chiefly in France, from the use of the tondeuse or hair-clipper, and among firemen and policemen. A small epidemic of 10 cases in the newspaper department of the General Post Office was also recorded by Dr. Colcott Fox. On critical consideration these examples of so-called contagion cannot be said to be absolutely conclusive. In certain instances we are dependent for the data regarding them on the statements of patients, many of whom

have a fixed idea that the disease is contagious. If the disease were capable, as has been suggested, of being spread by barbers in shaving, brushing, and cutting the hair, it ought to be much more common than it is, and should prevail more among the poorer classes than the well-to-do. In several of the epidemic outbreaks hyphomycetic fungi have been found, indicating that they were cases of ringworm and not of alopecia areata. On the other hand, it must be conceded that groups of cases do occur, such as that described by Dr. Colcott Fox, in which the most careful search has failed to reveal any fungus or micro-organism, and which suggest the possibility that there is a rare contagious type of alopecia areata due to an unknown virus. With the exception of such cases the great mass of evidence is against the view that the disease is contagious.

Relation to Ringworm.—The not infrequent association of alopecia areata with ringworm of the scalp in children has been advanced as another argument in favour of the parasitic origin of the disease, and it has even been asserted that when it occurs in adults it is the result of ringworm in childhood (Hutchinson). This view, however, is contrary to general experience. Alopecia areata may occur synchronously with tinea tonsurans, or it may follow it, either replacing the ringworm patches or affecting other situations on the same scalp. This association, however, does not prove that the disease is due to a fungus, and may be a mere coincidence of two common diseases of childhood. Where bald patches replace the ringworm they may be produced by irritating applications used in its treatment. On the other hand, cases occur in which the alopecia was present before the treatment was begun; in these the baldness is probably due to the deleterious action of toxins from the ringworm fungi acting on the hair papillae and interfering with the growth of the hair.

It has frequently been pointed out by the supporters of the parasitic hypothesis that the falling out of the hair in alopecia areata may be preceded and accompanied by a transient erythema, which disappears soon after the hairs fall out, that when a patch is spreading an erythematous border or halo precedes the defluvium of the hair, and also that the distribution of the patches may be similar to that of small-spored ringworm. These observations are a common experience, but are of little value as evidence; for whilst a certain number of cases have a distribution simulating that of ringworm, many have not, and either shew a markedly symmetrical arrangement or affect the margin of the scalp in a manner in which ringworm never does. So far as the transient erythema is concerned, a similar erythema not infrequently occurs before the defluvium of the hairs consequent upon the exposure to the *x*-rays, in which case the erythema can have nothing to do with micro-organisms or fungi, but is possibly the result of a mild inflammatory reaction due to the toxic influence of the dead cells of the hair bulb. On the whole, the evidence in favour of a parasitic cause is inconclusive, and the facts that it tends to recur, and is not infrequently symmetrically distributed, are in strong opposition to this conception.

(b) *Trophoneurotic Hypothesis.*—This hypothesis, though it seems to me to have more in its favour than the preceding, is also incapable of final proof, and is only applicable to a certain number of cases. According to it the defluvium of the hair is brought about by an inhibition of the function of the papilla of the hair by disease or destruction of the nerve supplying it. Those cases which have been grouped under the headings of alopecia universalis and alopecia localis seu neuritica are generally admitted to be of nervous origin, and to be due respectively to severe mental disturbance and to neuritis or destruction of the nerve supplying the affected area. Such cases prove that bald patches indistinguishable from those of alopecia areata can result from the section of a nerve or from neuritis due to injury. The patches occur, as a rule, in the area supplied by the affected nerve, but may appear elsewhere on the scalp, probably as a result of reflex nerve action, or be symmetrically distributed. In the ordinary cases of alopecia areata, apart from the local traumatic cases, no objective signs of inflammation or degenerative changes have been detected in the nerves supplying the bald areas, and the arguments in favour of the trophoneurotic hypothesis must consequently be based on clinical rather than histo-pathological evidence.

The principal arguments in favour of this hypothesis are as follows: (i) That injury to and disease of a nerve can cause baldness in the area supplied by that nerve, or in other situations from reflex action; (ii) that severe mental shock can cause partial or complete alopecia. A patient, the subject of repeated outbreaks of alopecia areata consisting of a few patches on the scalp, had a period of serious family trouble associated with great anxiety, and as a result a sudden recurrence of extensive alopecia areata took place, with complete defluvium of all the hairs of the body; (iii) that in a certain number of cases of ordinary alopecia areata, especially in adults, the bald patches are associated with localised nerve disturbances, either preceding or accompanying the defluvium. These may be sensory, such as localised neuralgia, itching, tenderness on pressure, and slight alterations in sensibility to heat and cold; secretory, such as impairment of the sweat functions so that the patch does not perspire even with injections of pilocarpine; or in the nature of a vasomotor paresis, shewn by failure of the bald patches to react so readily as the surrounding skin to chemical and physical irritants, as is seen by the difficulty of setting up inflammation in a patch of alopecia areata by any means short of strongly irritant applications, and of producing an inflammatory reaction upon it by means of the actinic rays of light; (iv) that the disease occurs not infrequently in association with different diseases of the nervous system such as chorea, epilepsy, facial paralysis, herpes zoster, and leucodermia or vitiligo. In most of these instances the association may be a coincidence; but this cannot be said with regard to leucodermia and melanodermia, for these are rare conditions, and yet their coexistence with alopecia areata has been repeatedly observed, the leucodermia in some cases preceding the alopecia, in others following it. Leucodermia is generally admitted

to be of neurotic origin, and where it coexists with alopecia areata it is reasonable to suppose that their pathogenesis is the same.

The chief arguments against the trophoneurotic hypothesis are: (i) That alopecia areata is most common in childhood and early adult life, at a time when worry, anxiety, and mental disorders are rarest; (ii) that it occurs frequently in patients apparently in perfect health, in whom there is no sign or suggestion of neurosis; (iii) that after puberty it occurs more commonly in males than females, whereas females are more prone to nervous disturbances; (iv) that it is rarely associated with pain or alteration in sensibility of the bald patches; (v) that only in exceptional cases do the bald areas correspond to the distribution of a nerve, and that in the great majority of cases no relation can be established between the bald patches and the area of distribution of a single nerve or group of nerves.

A consideration of these arguments for and against the trophoneurotic hypothesis will shew that it is far from being established, and that the most which can be said for it at present is that a certain number of cases are undoubtedly of neurotic origin, whilst there is no proof that any are due to a specific micro-organism.

The most recent hypothesis in support of the nervous explanation is that proposed by Jacquet in an elaborate thesis on the subject. He regards alopecia areata as a symptom reflexly produced by different states of irritation of the peripheral nerves, such as occur in association with the eruption of the permanent teeth, dental decay, and pharyngeal, laryngeal, bronchial, gastro-intestinal, and genital disorders. A certain number of cases he regards as being of central nervous origin, but the majority he believes to be due to local irritation of which the most common is that connected with the teeth. Out of 273 cases of alopecia areata he found that in 185 it began at a period corresponding to the eruption of the permanent teeth. Certain sites of dental pain are said to be associated with definite areas of alopecia; for example, the eruption of the wisdom teeth with alopecia of the neck, pain in the canines with alopecia of the chin, and dental troubles of the upper jaw with frontal and parietal alopecia, the bald areas corresponding roughly to Head's areas of referred pain from dental causes (Rousseau and Decelle). In certain cases when the dental troubles were removed by the extraction of carious teeth, the hair grew again in a few months. Painful trigeminal neuralgia has been followed by alopecia areata of the same side and has been associated with vasomotor phenomena, such as blushing of the face. Jacquet's ingenious hypothesis has not been generally accepted. Dental troubles are excessively common at all periods of life, and their association with alopecia areata is natural. I have examined a considerable number of children from this point of view, and have come to the conclusion that no definite causal relation can be established between the dental troubles and the alopecia, that the disease may occur in association with perfect teeth, and that it may be absent where serious dental defects existed. Nor have I seen any evidence that peripheral irritation

of the nerves of the larynx, gastro-intestinal tract, or genital organs can cause alopecia areata by reflex action. Cases are on record in which alopecia areata was associated with headache from eye-strain, and in which regrowth took place when the error of refraction was corrected; but such cases are rare and may be coincidences.

(c) *Toxic Hypothesis.*—Some cases of alopecia areata can be explained as the result of the action of a toxin either reaching the papilla by the blood-stream or locally produced in and around the hair follicle. The alopecia which frequently follows a patch of suppurating ringworm, or which occurs over and for a short distance beyond a furuncle of the scalp, is an example of baldness caused by toxins locally produced; the baldness which is caused by the injection of bacterial toxins in animals and that which results from taking acetate of thallium, which is a nerve poison, are examples of baldness produced by a toxin or poison circulating in the blood. The fact that a transient erythema may be associated with the falling of the hair also suggests the action of a toxin. This is borne out further by the type of cellular infiltration which is present and its distribution, the infiltration consisting chiefly of lymphocytes with a few mast-cells, and not confined to the papillae but occurring also about the capillaries in the neighbourhood of the follicle. This is what would be expected from the action of a toxin, whereas if it were due to bacteria in situ the infiltration would consist to a larger extent of polymorphonuclear leucocytes and the distribution would be more localised about the follicle. This hypothesis, however, is applicable to only a limited number of cases.

In conclusion, it may be said (1) that the trophoneurotic hypothesis probably accounts for a larger number of cases than the other two, and (2) that a few groups of cases have occurred which appeared to be contagious, and which suggested a microbic origin, though no micro-organism was found, but that except for these rare cases there is no definite evidence that it is parasitic.

**Diagnosis.**—The diagnosis of the ordinary form is not difficult. The occurrence of circular perfectly bald areas, in which the skin is smooth, white, and thinned, with, at the outset, a certain number of the ! stumps, is quite characteristic. In microsporon ringworm also there are round bald patches, but the baldness is seen on close inspection to be only comparative; the surface, instead of being smooth, is scaly, and is covered with hair stumps of a very different character from those of alopecia areata, being bent, broken, and twisted, and only to be extracted with pain and difficulty; or on slight traction they may break off short. Moreover, the fungus elements can always be found easily in these stumps, whereas in alopecia areata they are never found in the stumps, but only, if at all, in the loose hairs of the periphery, to which some portions of root-sheath are attached. In megalosporon ringworm, in which the patches are more definitely circular, the baldness, as a rule, is more complete, and there may be but a few stumps above the surface; these, however, are very brittle, dull, and lustreless, quite different from those of alopecia areata,

and the microscope readily reveals chains of sporulated mycelium, situated either on or in the hair stumps. Cases of pea-sized, smooth, bald spots are also seen to be due to ringworm, and careful search will generally reveal a ringworm stump near the bald spot.

The **Prognosis** in alopecia areata depends on the extent of the defluvium, the rapidity with which it occurred, the number of previous relapses, and the age of the patient. As a rule, it is fairly good for the majority of cases of partial alopecia under fifty; and even of the generalised cases, many end in recovery either partial or complete. The prognosis becomes bad if the denudation has been very rapid and complete, or if after a year there is no sign of regeneration anywhere; but no case should be given up until after thorough and prolonged treatment, as sometimes recovery takes place in the most unpromising instances. When, however, the scalp is thinned, and the orifices of the follicles to a great extent are obliterated, the hair follicles have probably atrophied past recovery. Even when the hair has completely grown the patient is not quite safe; relapses occur in fully 10 per cent of the cases, sometimes soon after apparent recovery; in others only after many years. The most unfortunate are scarcely ever free from one or more bald patches.

**Treatment.**—The internal therapeutics of alopecia areata are admittedly unsatisfactory. Those who believe in the trophoneurotic hypothesis for all cases give nervine and other tonics; but even in indisputable neurotic cases I have never been able to note decisive benefit from their administration. On the other hand, when the activity of the disease has ceased, change of air, especially to a bracing climate, has appeared, in a certain number of instances, to start the growth of hair, or at any rate to make it more vigorous. This is only what might reasonably be expected on either supposition, as hair-growth is always largely dependent on the general vigour. In some few instances pilocarpine, administered either hypodermically or by the mouth to the point of sweating, has appeared to be beneficial: it is best given at night; and, to avoid chills, the patient should sleep in flannel, or between the blankets. One-sixth of a grain of the nitrate may be given in solution by the mouth.

*Local treatment* is, however, of considerable importance. In an early stage blistering is sometimes successful in arresting the spread of the disease; liquor epispasticus may be painted on or around the bald patch, but in my opinion Bulkley's plan of rubbing on strong carbolic acid is preferable. This application does not actually blister, but the skin of the part to which it is applied peels off in a few days; of course a small area only should be treated at a time. The other local remedies which find advocates are legion, and testify to the obstinacy of the affection. Viewed as a whole, however, it will be found that the remedies which have the most advocates are all stimulating parasiticides, generally applied with friction; and as one object of the treatment must be to improve the circulation in the diseased area, this may best be effected by rubefacients,

friction, and, in a later stage, by galvanism or faradism. As a consequence of these principles of treatment, the wearing of wigs should be discouraged as much as possible, as the pressure of the springs interferes notably with the cutaneous circulation; general shaving also, although in itself not injurious, is better avoided because it necessarily entails the use of a wig. In my hands the most useful remedies are perchloride of mercury and turpentine. These may be usefully combined in the proportion of from two to five grains of perchloride of mercury, a dram of spirit, and seven drams of turpentine or oleum pini sylvestris; the mixture must be freshly made every week. Sponging the part with acetic acid in the proportion of one to four of water, and then painting on tincture of iodine, is also useful. In some obstinate cases a chrysarobin ointment—from 5 to 10 per cent—well rubbed into a small area is very valuable. It should not be used too near the face, nor over the whole head, on account of the severe erythema which may be excited by its use. Its use is still further restricted by its dyeing the rest of the hair an indelible purple, and by its staining all articles of linen in a similar manner. Other methods of treatment are rubbing in sulphur ointment, biniodide of mercury ointment (5 grains or more to the ounce of lard), strong liniments such as compound camphor, the expressed oil of mace, and many other similar applications. In all these the shampooing necessary for their thorough application plays an important part in the treatment. In recent years the *x*-rays, actinic rays, and high-frequency currents have been employed in the treatment of this disease. Small doses of *x*-rays have a stimulating effect on the growth of hair, but I have not seen any distinct benefit from their use. The brush-discharge from a high-frequency apparatus is a much more powerful stimulant, and in certain cases causes the hair to grow. I have found the actinic rays from a Finsen-Reyn lamp or a uviol lamp to be most useful physical stimulants, and in several instances have observed regrowth to take place under them in cases which had resisted other forms of local treatment. Neither the patient nor the medical attendant must be disheartened by the slow progress, which is often the best that can be attained; remembering that steady perseverance is sometimes successful in long-standing, very obstinate, and apparently hopeless cases.

Alopecia Cicatrisata or Pseudo-Pelade.—Syn.: *Alopecia circumscripta seu orbicularis* (Neumann); *Alopécie cicatricielle* (Besnier).

**Definition.**—A disease of the scalp causing destruction of the hair follicles in small cicatricial areas which coalesce to form large atrophic bald patches.

This affection was originally recognised by Neumann, but Brocq gave the fullest description of it in 1885. This disease usually begins insidiously, without pain or signs of inflammation, and is commonly noticed first accidentally in brushing or combing the hair, as several small bald patches situated about the vertex of the scalp or the occiput. On examining the scalp carefully a few more bald patches are generally

detected. These patches vary in size from a pin's head to a lentil, and are round or oval in shape, white or pinkish in colour, and present a smooth, depressed, soft and atrophic surface over which the sensibility is diminished. Larger patches about the size of a sixpence may be present: these, instead of being roundish, usually present an irregular border, and tend to spread peripherally and to coalesce to form large bald areas the size of the palm of the hand, or even more extensive. These large patches are irregular in outline, and serrated from projection into them of unaffected portions of the scalp. Though the disease is usually progressive, even in the most extensive cases complete baldness does not result, but a marginal band and a few islands or tufts of hair, irregularly distributed, are spared.

No stumps or broken hairs occur in association with the bald patches, but a certain number of long hairs appear to be missed out by the morbid process, and remain either as stumps or tufts, or as isolated hairs distributed here and there over the bald areas. These hairs, however, are found to be affected, and come out with the slightest traction. On epilation the intra-follicular portion of the hair is thick, translucent, and hyaline from the presence of an adherent, moist, and swollen root-sheath. Where the affection has existed for some time, the root-sheath dries up to form a cheesy powder, and the intra-follicular portion of the hair becomes shrivelled and tapers to a fine point like the "point-of-exclamation" hairs of alopecia areata. Occasionally the shaft breaks off leaving the follicle plugged with a stump or plug which scarcely projects above the level of the skin. No evidence of suppuration occurs at the follicles, but not infrequently a faint pink inflammatory halo is present around them. Sometimes small scales may be detected at the follicular orifice and about the hair; these disappear when the hair is shed. In a case under my care in which the affection was associated with pityriasis, greasy scales were present at the mouth of the follicle and for a short distance up the shaft of the hair. In the same case slight pitting occurred when the hairs were shed, but became obliterated as the patch became atrophic. The hair at the border of the bald areas was apparently healthy, and there were no transition stages between the patches and the healthy scalp.

The sites of predilection of the disease are, in order of frequency, the vertex, upper and median part of the occiput, and the temples, but any part of the scalp may be attacked except the margin. The lanugo hair of the body is not involved, nor are the eyebrows, eyelashes, or beard. The nails, though as a rule unaffected, may present dystrophic changes, such as softening, discoloration, pitting, and other irregularities. In a case under my observation, in a young lady, a number of the teeth became loose and fell out about the same time as the hair became affected.

The evolution of the disease is usually slow. Its course is rarely continuous, but generally intermittent with periods of rest and activity. Occasionally, after existing for several years in a comparatively mild form,

it may suddenly become active, and result in the loss of the greater part of the hair in a few months.

**Histo-pathology.**—This has been specially studied by Lenglet from a microscopical examination of three cases. He finds that the main histological features are pronounced dilatation of the capillaries between and around the hair follicles, the capillaries being filled with red blood-cells and a few leucocytes, and a cellular infiltration consisting of lymphocytes with a few plasma cells and mast cells surrounding the dilated capillaries, collected in masses about the upper part of the hair follicle and extending down from there to the hair papillae in attenuated columns. The connective tissue around the capillaries and in the neighbourhood of the follicles is rarefied, the collagen fibres being separated by oedema and the elastin destroyed. The epithelium either shews no definite change or is atrophied. A characteristic feature of the sections is the presence of numerous pigment cells in the papillary layer of the corium.

According to Brocq, the death of the hair is brought about by the cellular infiltration enveloping the follicle and causing it to break up, the cells passing in and separating the component elements of the follicular wall. No definite micro-organisms or fungi were detected.

**Etiology and Pathogenesis.**—This affection occurs in adult life and usually between the ages of twenty and forty-five years. It is more common in men than in women, and chiefly attacks persons with coarse dark hair. There is no evidence that it is contagious. Its nature and pathogenesis are unknown. In certain respects it suggests a parasitic origin, but repeated attempts to find micro-organisms in the swollen root-sheath and bulb have been invariably unsuccessful, and cultivation experiments have given negative results, except in one instance in which a culture of a peculiar coccus was obtained (Bunch), but this observation has not been confirmed. It seems to me to be more easily explained on the assumption that it is a toxic condition rather than due to a micro-organism in situ. It has been suggested, on the other hand, that it is of trophoneurotic origin, but there is no conclusive evidence in favour of this hypothesis.

**Diagnosis.**—The clinical peculiarities of "pseudo-pelade" are so characteristic—namely, the depressed atrophic bald patches, the absence of stumps, and the diseased long hair with the swollen root-sheaths—that no great difficulty should be experienced in its differential diagnosis. It might be mistaken for the atrophic patches caused by favus, but a microscopical examination of the hair for the fungus of favus would easily establish this diagnosis.

Certain difficulties might arise in distinguishing it from small patches of sclerodermia, cicatricial alopecia due to trauma, or the scars following severe herpes zoster, but the numerous lesions, the glossy, atrophic, bald skin, and the hairs with the swollen root-sheath would prevent this mistake. From alopecia areata it is differentiated by the absence of "point-of-exclamation" hairs and the definite atrophy and depression of the bald patches. It might be confused with lupus erythematosus of

the scalp, but no serious difficulty should be encountered in distinguishing them. In lupus erythematosus the bald patches are red from the presence of telangiectases, pitted or covered with adherent scales, and characteristic lesions are usually present elsewhere on the face or on the ears.

The affection described by Brocq as keratosis pilaris may present some difficulty in differential diagnosis, but in it small red papules occur round the hairs, which are thin and have no swollen root-sheath, the affected scalp feels rough like a nutmeg-grater, and follicular acuminate papules are generally present on the extensor aspects of the limbs and on the eyebrows.

From the condition described by Lailler as "acné décalvante," and by Quinquaud as "folliculites épilantes et destructives," the diagnosis may be difficult, but in it the peri-follicular suppuration is more marked than in pseudo-pelade. The affections are so much alike, however, that Brocq considers acné décalvante to be pseudo-pelade complicated by folliculitis.

**Prognosis.**—The disease is slowly progressive, but occasionally it may be arrested by thorough treatment, and it may sometimes cease to spread spontaneously. As the follicles are destroyed by the disease, the hairs can never grow again and permanent baldness is inevitable.

**Treatment.**—As the pathogenesis of the disease is unknown the treatment of it is more empirical than rational. Any defect in the general health should be carefully sought for, and an attempt made to correct it by suitable means. The local treatment generally adopted is based upon the assumption that it is a microbic affection, and consists in epilation of the affected hairs and the thorough application of parasiticide lotions or ointments containing mercury, sulphur, resorcin, or ichthyol. Brocq advocates a lotion of perchloride of mercury, 1 in 500, or an ointment containing yellow oxide of mercury. Crocker employed an ointment of the biniodide of mercury, containing 2 grains in an ounce of vaseline.

CANITIES.—SYN.: *Greyness or whiteness of the hair; Poliothrix.*

There are all grades of whiteness of the hair, both as regards proportion and distribution of the abnormally white to that of the normal tint, and the way the pigment is distributed through each hair.

The white hair may be uniformly disseminated through the normally coloured hair; or it may be more marked in some regions than in others; or the white hair may be in one or more tufts; or the scalp may be white, and the rest normal or only grey; or only one of the other regions—such as the eyebrows—may be affected; or, finally, the whole of the hair in every region of the body may be completely white.

Canities, as a rule, comes on very gradually; but in some cases the change is more rapid; there are some well-authenticated instances in which partial or complete blanching occurred in twenty-four hours. As a rule canities, when once established, is permanent; but there are

instances in which the hair of man has behaved like that of Arctic animals, and was grey in winter and dark in summer; and again, in which perfectly white hair in men of sixty or more has become dark again. In individual hairs also the whiteness may be partial, being limited to either end or both ends; or the whiteness may be in narrow rings alternating with dark rings, constituting the so-called "ringed hair."

**Causes.**—Canities may be one of many evidences of senile decay, premature or normal as regards the age of the patient; or it may occur in young patients—even in early childhood. In children it is generally in tufts or bands, and occasionally one or more tufts have been present at birth, and this feature has been hereditary through several generations. When acquired, single tufts have followed severe headache or neuralgia, or have appeared as one of the manifestations of leucodermia; and in alopecia areata the new hair is sometimes quite white for a time. The eyelashes sometimes turn white in sympathetic ophthalmia, after destruction of the opposite eye. Complete blanching of the whole or part of the hair has occurred after mental shocks, as in poignant grief or intense fear; it may occur also in melancholia. Ordinary premature greyness may follow the exhaustion of specific fevers, or any other such debilitating condition, whether mental or physical. Like other abnormalities of the hair it often runs in families. Seborrhoea is a common cause of grey hair, but it seldom results from intense follicular inflammation.

The **pathology** of sudden blanching of the hair is supposed to be the rapid formation of minute bubbles of air in the substance of the shaft, but what may be called the normal whiteness of old age is due to the atrophy of the pigment-carrying cells.

**Treatment.**—As already seen, recovery may take place spontaneously, or as the result of some accidental condition; but this is the exception, and not the rule. Treatment is only likely to be successful if the canities can be traced to a definite and removable cause; thus, in a case of chlorosis canities occurred in patches which recovered their colour when the chlorosis was removed. Greyness due to seborrhoea may be successfully combated by treatment appropriate to the latter condition. If it has arisen from nervous or physical strain, then rest, tonics, and other general hygienic measures would be indicated. Pilocarpine nitrate, injected subcutaneously in doses of one-tenth to one-sixth of a grain, has been successful; and faradisation with the electric brush ought to be tried.

HIRSUTIES. — SYN.: *Hypertrichiasis; Hypertrichosis; Polytrichia; Trichauxis.*

Hirsuties is applied to an increase in the number or size, or both, of the hairs, which may grow either in the normal or an abnormal position. This overgrowth, when it occurs in normal positions, may be in the direction of the quantity, the coarseness, or the length of the hair; thus, the hair of the head or of the beard may grow to the length of many feet. Overgrowth may also occur in any other part of the natural hairy system;

and occasionally, even where it is usually downy, the lanugo may be developed in length and thickness until the whole body is covered with a kind of fur. This increase seems to be more common in certain races, such as the Burmese and the Ainus of Yezo.

Slight degrees are common in abnormal positions, and occasionally both women and children may have an enormous growth of moustaches, beards, and whiskers. Among etiological factors, besides occasional racial peculiarities, family disposition often plays an important part. Congenital lumbar hypertrichosis is associated with concealed spina bifida. Hirsuties may occur in association with malignant hypernephromas, especially in children (Bulloch and Sequeira). In women, hirsuties is often associated with disorder of the genital organs, or during the abeyance or disorder of the sexual functions; it is therefore very common in insane women. It is often associated with amenorrhoea, and with the climacteric period and onwards; less frequently it may occur at puberty or during pregnancy. Although moderate excess is common in strong men, many cases of excessive growth in normal positions have occurred after severe illnesses. It sometimes follows local irritation. Unless due to a temporary cause, such as pregnancy, defective health or a local irritant, the overgrowth is usually permanent.

**Treatment.**—This is only successful when the hirsuties is moderate, such as occurs so commonly on the chin of women; and the most satisfactory treatment for it is by electrolysis. A fine needle connected with the negative pole of a galvanic battery is introduced by means of a suitable holder to the bottom of the hair follicle, the needle being kept parallel with the direction of the hair; the circuit is then completed as the patient grasps the positive pole tightly. This pole is a graphite or metal cylinder covered with chamois leather wetted with a solution of salt and water. A current of from 2 to 4 milliamperes is sufficient. Bubbles of froth appear by the side of the needle, which, if the hairs are coarse, is gently moved round the follicle; after from twenty to thirty seconds the needle is withdrawn, and gentle traction made with forceps; if the hair is not perfectly loose the needle should be replaced and the electrolysis repeated. At the site of removal a small red papule is left; this soon flattens down to a red spot, and eventually whitens into a minute scar, which, if the operation be skilfully effected, will be perceptible only where the hairs were coarse. If for any reason this operation cannot be undertaken, temporary removal may be attained by means of epilation, shaving, or depilatories. Epilation makes the hair grow coarser and longer, and frequent shaving is repugnant to most patients; habit overcomes this prejudice, and where the growth is so abundant that it cannot be dealt with by electrolysis, it is the best method of temporary removal, and even by inexpert persons can be safely managed with a mechanical razor. Depilatories are no better than shaving, and are apt by their irritating and caustic action to inflame the skin. One of the best consists of sulphide of barium ʒj., oxide of zinc and powdered starch āā ʒiij. This is mixed into a thin paste with water,

and applied to the hairy parts for ten to fifteen minutes ; when the skin begins to burn, it is cleaned off, a soothing ointment is applied, and then a starch powder to conceal the redness ; but neither this nor any other depilatory is to be recommended. The Röntgen rays have been employed for the removal of the hairs, but this is an unsafe treatment, because if a sufficient dose be given not only to remove the hairs but to prevent regrowth, it is necessary that destructive changes should be produced in the hair follicles and papillae, and this cannot be done without, at the same time, causing a dangerous inflammation of the skin itself. In dark persons, to blanch the hair by such means as peroxide of hydrogen has been employed to mitigate the deformity.

MONILITHRIX.—SYN. : *Moniliform or beaded hair.*

In this very rare affection fusiform nodes occur in regular succession from root to tip with narrow connecting portions between them. The nodes and internodes are all uniformly coloured, but the nodes, from their greater thickness, appear darker. The hair easily breaks at the internodes, it is generally short and scanty, and keratosis is a usual concomitant. The affection is not always confined to the scalp, but may affect the whole of the hairy system. In the majority of cases it is congenital, and is then often hereditary through many generations, and exhibits family prevalence ; but several cases have been acquired, one as late as fifteen from nerve shock, other cases have followed acute illness.

Successful treatment is only possible in acquired cases, and should be directed towards the improvement of the general health, while local stimulation of the scalp is obtained by the faradic brush. If any seborrhoea be present the treatment appropriate to this condition should be employed (*vide* p. 687).

TRICHORRHEXIS NODOSA.—SYN. : *Trichoclasis.*

This is a rather uncommon condition of the scalp, and may be defined as green-stick fracture of the hair-shaft. It presents to the naked eye the appearance of whitish bead-like swellings, situated irregularly along the hair-shaft. Under the microscope, owing to the splitting up of the outer portion of the hair into its constituent fibres, it presents the appearance of two brushes stuck end to end. The remaining central portion gives way on very slight traction, leaving the growing portion of the hair with a bristly end. It chiefly attacks the whiskers, beard, or moustache of men, but it may also attack the coarse hairs of the eyebrows or of other parts of the body ; and occasionally the scalp of either sex.

The disease is much more common on the continent of Europe than in Great Britain. It has hitherto been considered as a trophoneurosis, resulting in preternatural brittleness of the hair ; but, according to Paul Raymond, who found it frequently on the pubes of women, it is due to a diplococcus, and is to a certain extent communicable by contagion.

Hodara described a peculiar bacillus in the disease, and Essen again a different one; so that the true pathogeny is not solved as yet. According to Dr. H. G. Adamson and others, the affection may result from mechanical injury, in brushing and combing, in a hair weakened by general malnutrition or disease of the scalp.

The **treatment** is very unsatisfactory, shaving has sometimes been effectual when long continued; but, generally speaking, the hair grows as badly as ever. Local faradisation may be tried, and change of climate has sometimes seemed to be efficacious. If the parasitic origin be probable, sponging the hair with antiseptics, such as perchloride of mercury or carbolic acid lotions, would appear to offer the best chance of success. These methods might be combined.

FOLLICULITIS.—Inflammation in and around the hair follicle is very common in some form or other, and varies in degree from what clinically appears to be no more than congestion up to destructive suppuration of the whole follicle. It may occur as part of a general inflammation of the skin, as in eczema and psoriasis; or it may constitute the leading feature of the disease, as in the group included under the name "lichen," in pityriasis rubra pilaris, and in several of the hyphomycetic parasitic eruptions such as favus or ringworm, especially the kerion form of the latter; or finally it may constitute the whole disease, as in the folliculitis decalvans of Quinquaud, the dermatitis papillaris capillitii of Kaposi, and coccogenetic sycosis. The first two, being very rare, will require only brief notice.

Leloir's conglomerative pustular peri-folliculitis has been shewn by Sabouraud to be due to one of the trichophyton fungi, and is therefore merely a variety of kerion.

**Folliculitis Decalvans.**—This affection was described independently by Quinquaud under the heading of *Folliculite épilante*, and by Lailler and Roberts as *acné décalvante*, and is closely related to if not a further development of the "pseudo-pelade" of Brocq (*vide* p. 716). It is a chronic folliculitis of the hairy parts, especially of the scalp, which leads to a cicatricial alopecia in patches of about the size of a shilling, smooth and polished except at the periphery, with an irregular outline, and possibly red points interspersed in the white cicatricially depressed surface. Erythematous papular or pustular inflammation of the follicles occurs at the periphery of the cicatricial patch. Pus cocci, and other organisms in pairs and fours, have been found in the peri-follicular inflammation which characterises the disease. The treatment is an antiseptic one. To stop the disease from spreading, therefore, the parts should be sponged with an acetic acid lotion (one to eight), and then tincture of iodine painted on and round the patch, a procedure which should be repeated for ten days or a fortnight; or, if the patch be a small one, a lotion of perchloride of mercury (one grain to the ounce) may be applied on lint and covered with oiled silk, the dressing being changed night and morning. The hair follicles being completely destroyed by the morbid process, permanent

baldness of the parts necessarily results. This disease is probably closely if not pathogenetically related to the next affection, but its site is different, and the process is less deeply seated.

**Dermatitis papillaris capillitii** is another rare affection which occurs usually on the hairy border on the back of the neck, but may attack other parts of the scalp (MacLeod). It is described on p. 193.

Sycosis.—Syn. : *Acne mentagra ; Folliculitis barbae.*

Until recently sycosis was described as being either parasitic or non-parasitic ; the parasitic form being due to ringworm fungi, and sometimes called tinea barbae. It has now been shewn that the so-called non-parasitic sycosis is likewise parasitic and due to the *Staphylococcus aureus* and *S. albus*, which, by their presence in and round the follicles, set up a purulent folliculitis. The coccogenetic form is dealt with in the article on "Dermatoses of Staphylococcic Origin" (p. 190), and the hyphogenetic form or tinea barbae under ringworm (p. 136).

Diseases of the Hair Follicles associated with the Presence of Horny Plugs or Filiform Spines (Keratosis suprafollicularis, Lichen pilaris seu spinulosus).—The subject of the follicular diseases of the skin in which horny plugs or filiform spines are present in the follicles is a difficult one, and its difficulties have been much increased by the confusion which now exists with regard to its nomenclature. This is due (i) to the employment of the same name, modified perhaps by an adjective to signify different conditions ; (ii) to the use of different names to signify the same affection ; and (iii) to the employment of names which do not properly indicate the nature of the affection to which they are applied.

There are certain cutaneous affections in which spines or horny plugs in the follicles occasionally occur, but are not a characteristic symptom, such as lichen planus, lichen scrofulosorum, pityriasis rubra pilaris, seborrhoeic dermatitis and miliary follicular syphilides, and there are others in which they are the essential and diagnostic feature. In the latter category may be placed acne vulgaris (comedones), psorsopermosis follicularis vegetans (Darier), lichen pilaris seu spinulosus, and keratosis suprafollicularis (Unna). The first and second of these have been described elsewhere, the third and fourth require description here. Lichen pilaris seu spinulosus is a definite affection of the pilary system characterised by the presence of spines projecting $\frac{1}{16}$ to $\frac{1}{8}$ of an inch from the hair follicle, and the non-committal designation of keratosis suprafollicularis (Unna) covers a group of cases which are closely allied in having as their essential characteristic horny plugs or scales blocking the pilo-sebaceous follicles.

**Keratosis Suprafollicularis** (Unna).—Syn. : *Cacotrophia folliculorum* (Tilbury Fox) ; *Folliculitis rubra* (Wilson) ; *Keratosis follicularis* (Kaposi) ;

*Keratosis pilaris* (Brocq). And closely allied to it, if not the same affection, *Ulerythema ophryogenes* (Taenzer); *Follicular Xerodermia* (Liveing); *Ichthyosis cornea* (Hardy); *Ichthyosis follicularis* (Lesser); *Kératodermie pilaire* (Thibierge).

*Definition.*—An affection of the skin characterised by the presence at the orifices of the hair follicles of horny plugs or scales forming small acuminate papules.

*Etiology and Pathogenesis.*—This affection usually begins in childhood; it may occur at any age, but it is rare in old people. Mild degrees of it are common in those who rarely take baths, and whose occupation exposes them to dust and dirt. On the other hand, it may be associated with malnutrition, and was believed at one time to be essentially a disease of the badly nourished and scrofulous, hence the name applied to it by Lemoine in 1882, "ichthyose ansérine des scrofuleux." It has a distinct tendency to occur in families. In a series of cases observed by Mr. Treacher Collins and myself it attacked three boys out of a family of five. It has been known to occur also in children of ichthyotic parents. The exact nature of all the cases is uncertain, but in a considerable number it is undoubtedly of congenital origin, and a variety of ichthyosis in which, owing to some individual peculiarity, the ichthyotic process affects the outer parts of the pilo-sebaceous follicles. There are others in which the lesions do not appear till later in life, in which there are no signs of xerodermia or ichthyosis, or of an inflammatory disturbance, such may be an acquired condition due to the local irritation or dirt or the elimination of toxins in a badly nourished skin. In these cases the horny plug or scaly cap is the primary lesion, and any inflammatory changes which supervene are the result of its presence. The other view that the inflammatory changes are primary and precede the hyperkeratosis has already been referred to.

*Histo-pathology.*—The most noticeable features in the histology of a case of ichthyosis follicularis recently examined by me were marked dilatation of the funnels of the pilo-sebaceous follicles, which were filled with horny plugs, extending up beyond the level of the skin and forming acuminate papules. The lower two-thirds of the follicles were atrophied, and in some of them pieces of atrophied hairs occurred. The horny plug consisted of a dense central portion, and a peripheral part with the structure of a loose horny network and a tendency to a concentric arrangement. The sebaceous glands were atrophic or absent. The epidermis between the follicles shewed slight hyperkeratosis forming a loose network, the prickle-cell layer being thin and the interpapillary processes flattened out. There was no evidence of parakeratosis. In the underlying corium there was a slight dilatation of the blood-vessels in the neighbourhood of the follicles, and an infiltration of small roundish or oval connective-tissue cells around the dilated capillaries. The connective-tissue fibres were normal, and not rarefied as they are in inflammatory processes. From the histological examination it seemed to me that the primary change was in the epidermis, and consisted of a process of hyperkeratosis

not only affecting the funnels of the follicles but the intervening skin as well, leading to the formation of a horny network like that found in mild degrees of ichthyosis. The atrophy of the lower part of the follicles seemed to be simply the result of mechanical pressure due to plugging. The slightly dilated blood-vessels and perifollicular cellular infiltration suggested a mild inflammatory process secondary to the presence of the plug in the follicle acting as a foreign body, and readily exposed to friction. Other descriptions of the histology have been furnished by Unna, Lemoine, and Giovannini, which differ from the above in that pronounced inflammatory changes were found not only around the follicles, but also between them, which led these writers to the conclusion that the affection was inflammatory in origin.

*Symptoms.*—The essential lesions of this affection consist of pin-head-sized, rounded or acuminate papules, resulting from the blocking of the follicles by horny plugs ½ to 1 mm. in height. These papules may be pale like the surrounding skin, or of a dirty greyish colour, or they may be pinkish and present small telangiectases around the hair. Considerable diversity of opinion exists as to whether these papules are of inflammatory origin or whether the inflammation which is present in a few of them is a secondary phenomenon and due to local irritation or to the inoculation of adventitious micro-organisms.

In the pale lesions, at all events, the papular elevation is entirely due to the horny plug, which can be easily picked out, leaving a depression, and is simply a non-inflammatory hyperkeratosis of the mouth of the follicle. The papule may be pierced by a hair, but, as a rule, the hair is coiled up beneath the horny plug or scaly cap. The skin between the papules is more or less harsh and dry, and sometimes definitely scaly and ichthyotic ; it may be pale in colour or red and mottled in the legs. As a rule there are no subjective symptoms, but occasionally intense itching may be present. The mildest cases of this affection consist of a sort of permanent goose-skin affecting the extensor aspects of the arms and thighs and occasionally the trunk. In a more severe type of case such as that described by Brocq as keratosis pilaris, the lesions are distributed without order on a normal or xerodermic skin, and are arranged in irregular patches, sometimes enclosing areas of healthy skin. In addition to the extensor aspects of the limbs and the trunk, the face is frequently affected especially about the eyebrows, forehead, and jaws, the lesions there being more numerous, though smaller, than those of the trunk and limbs. The papules on disappearing are frequently replaced by small cicatrices, and the skin assumes an atrophic appearance. Occasionally the skin instead of being white and cicatricial is pink and inflamed. This is specially noticeable on the eyebrows. In the most severe cases the scalp is affected, and there is more or less complete baldness, the eyebrows and eyelashes are absent, and plugged follicles are irregularly distributed over the skin, except on the palms and soles. The sweat glands are not affected, and the patients can perspire freely on exertion. The skin is xerodermic, and in certain situations such as the knees,

buttocks, and thighs, definite ichthyosis may be present. Cases of this type usually occur in families, and begin in early life. At birth the skin appears to be healthy, but within two years evidences of the disease are generally present. The first region to be affected in these severe cases is not infrequently the eyebrows. Such cases appear to be of the nature of ichthyosis affecting the follicles, and they have been described as "ichthyosis follicularis" by Lesser and myself.

What may provisionally be regarded as a still more advanced stage of this affection was described by Taenzer under the heading of a scar-leaving erythema of the eyebrows (*ulerythema superciliare seu ophryogenes*). Taenzer observed altogether 6 cases of this scar-leaving follicular disease, which began in 5 of the cases in early childhood, with redness of the eyebrows, followed by loss of the hair. From there it spread till it affected the forehead, cheeks, scalp, and extensor aspects of the limbs. The scalp was more or less bald, and the eyebrows, specially on the outer halves, were hairless. The essential lesion consisted, as in the milder types described above, of acuminate plugged follicles. The additional peculiarity in Taenzer's cases was that after the disease had persisted for some years marked atrophy occurred at the orifices of the follicles, resulting in the formation of depressed cicatrices surrounded by a hyperaemic halo, giving to the scalp an appearance as if it had recently recovered from favus.

It is not definitely decided, however, whether the above types of keratosis of the follicles represent different stages in a common pathological process, or whether two distinct entities have been included, namely (*a*), an ichthyotic process causing a group of symptoms, in which inflammation, if it occurs, is a secondary phenomenon, and to which the name "ichthyosis follicularis" may be applied, and (*b*) an acquired condition which may occur later than when ichthyosis usually manifests itself, resulting from a chronic inflammation at the mouth of the follicles, and corresponding to the "kératose pilaire rouge" of Brocq. There is no doubt that cases of mild plugging of the follicles on the extensor regions of the limbs and elsewhere may occur at any age apart from ichthyosis. These cases are so common as to attract little attention, and are frequently associated with malnutrition. In them there is no definite evidence of inflammation about the lesions, and they may be the result of a simple keratosis of the follicles, caused by local irritation or the elimination of toxins by the skin.

*Diagnosis.*—Mild degrees of this affection resemble "goose skin" (cutis anserina), but goose-skin is a transient condition due to cold or fright, whereas even the milder degrees of keratosis suprafollicularis are persistent and essentially chronic. In the case of goose-skin also the lesions cannot be picked out by the nail like the horny papule in keratosis follicularis. The disease with which it is most liable to be confused is *lichen pilaris seu spinulosus.* The chief points of distinction between it and lichen spinulosus are: (i) That in the latter the lesions are invariably papules with filiform spines projecting above the surface, whereas in

keratosis suprafollicularis many of the lesions are simply acuminate follicles with a horny plug at the orifice, giving the feeling of a nutmeg-grater; (ii) that in lichen spinulosus the lesions occur in definitely circumscribed patches or groups, and are not irregular and diffusely distributed about the extensor aspects of the limbs; and (iii) that in lichen spinulosus the long hairs of the scalp and eyebrows are not affected, there is no family tendency, nor is the affection associated with xerodermia or ichthyosis.

From *pityriasis rubra pilaris* there is no difficulty in distinguishing this disease, as in the former there is marked redness from inflammatory changes, scaly keratosis of the palms and soles, follicular plugged papules on the backs of the fingers, and a tendency for the acuminate papules to coalesce to form patches.

*Prognosis.*—The condition persists indefinitely unless treated. In mild cases it can be greatly reduced by suitable local applications; in widely distributed cases with marked ichthyosis all that can be done is to keep it in check and to render the skin as smooth as possible by judicious treatment.

*Treatment.*—The treatment for this affection is similar in the main to that described at length in connexion with ichthyosis. It consists of warm baths, with the application of soap-spirit lotion on a piece of flannel, or of vapour baths. Keratolytics, such as resorcin or salicylic acid gr. xx., applied in glycerin of starch, are soothing and effective. Where the skin is very dry it should be inuncted daily with some oily application, such as almond oil 2 parts and lime water 1 part.

**Lichen Pilaris seu Spinulosus.**—SYN.: *Keratosis follicularis spinulosa* (Unna); *Kératose pilaire engainante* (Audry); *Acné cornée* (Leloir, Vidal); *Acné sébacée cornée* (Guibout).

*Definition.*—A rare affection of the skin characterised by the presence of groups or patches of small conical follicular papules with projecting filiform spines.

*Incidence.*—Of this rare affection some 20 cases have been shewn during the last twenty years of the Dermatological Society of London. Though in recent years it has been recognised as an entity in this country, it was formerly confused with keratosis pilaris, an affection with which it has only the most superficial resemblance. On the Continent, however, there is still considerable confusion regarding it, certain observers refusing to accept it as a distinct disease.

*Etiology and Pathogenesis.*—The disease affects children as a rule, though cases have occurred in adults, and it is most common in boys. It has been observed in several instances in pale, delicate children. The pathogenesis is uncertain. Certain writers regard it as an inflammatory condition, and state that in an early stage of the lesions an inflammatory halo may be observed around the follicular orifice, and that this is replaced by the conical papule. Those who consider it to be non-inflammatory have not noted these early signs of inflammation, and suggest

that it may be toxic in its origin, as it is well known that toxins eliminated by the skin can produce hyperkeratosis.

*Histo-pathology.*—The histo-pathology of this affection has been studied by Leloir and Vidal, Audry, Adamson, Lewandowsky, and others. There is considerable unanimity among these observers with regard to the essential features of the minute anatomy, but considerable divergence of opinion with regard to their interpretation. The principal changes are a dilatation of the upper third of the pilo-sebaceous follicles to form a funnel containing a horny plug which extends beyond the level of the epidermis. This plug is composed of concentrically arranged lamellae of flattened horn-cells welded together. The bulb of the hair is not affected, but the sebaceous glands are more or less atrophied. There are no definite changes in the corium, only a slight increase in the connective-tissue cells at the neck of the follicle and about the vessels of the papillae. On this account, and from the fact that he was unable to detect lymphocytes or leucocytes about the follicle, Dr. Adamson concluded that the condition was not of inflammatory origin, but was a purely epidermal process. Nor are the changes entirely confined to the hair follicles, for the neighbouring skin shews a thickening of the prickle-cell layer (acanthosis) and a slight degree of hyperkeratosis.

*Symptoms.*—The essential lesion consists of an acuminate papule about the size of a pin's head, pale like the surrounding skin, or pinkish in tinge, and situated at a pilo-sebaceous follicle, from the orifice of which projects a filiform horny spine from $\frac{1}{16}$ to $\frac{1}{8}$ of an inch above the surface. These lesions are aggregated together in roundish groups or patches varying in size up to 6 or 8 inches in diameter. Some of the patches are oval in shape, others irregular. They are more or less symmetrically distributed, and are most commonly situated about the nape of the neck, buttocks, abdomen, back of the thighs, and extensor aspects of the arms. Here and there a few isolated lesions may be detected. The affection does not give rise to any inconvenience from itching or other subjective symptom. The eruption may develop acutely or slowly, and a patch may appear in a night, gradually spread for a few days, then remain unaltered for an indefinite period if untreated.

*Diagnosis.*—Spiny lesions similar to those of this disease may occur in association with lichen scrofulosorum, miliary syphilides, and lichen planus, and more rarely with pityriasis rubra pilaris. In true lichen spinulosus the spiny lesions contribute the whole of the eruption, whilst in the other conditions mentioned they are accidentally associated with characteristic lesions of the different diseases.

The diseases with which it is most liable to be confused are keratosis pilaris and pityriasis rubra pilaris. In *keratosis pilaris* the eruption consists of slightly elevated follicular papules surmounted by a horny cap or scale, beneath which is a rolled-up hair. When the scale is scratched off a depression or pit is left, and there are no spines. The lesions are not grouped in patches like those of lichen spinulosus, but are diffusely distributed in certain regions such as the extensor aspects of the arms and

legs, and may be present on the scalp and eyebrows, situations in which lichen spinulosus does not occur. It is a much more common disease than lichen spinulosus, and may occur at any age.

In *pityriasis rubra pilaris* the lesions are larger, and rarely spiny, are much more widely distributed, are not grouped except on the dorsum of the fingers, and are associated as a rule with marked thickening of the palms and soles.

Dr. Brooke, under the heading of *keratosis follicularis contagiosa*, described an affection of the skin which is closely allied to lichen spinulosus, and certain cases of which are probably identical with it. The disease described by him occurred in families, and was believed to be contagious. The elements composing it consisted of follicular papules plugged with comedones or long filiform spines, and associated with them were large fleshy papules. There was no marked tendency to grouping, and the eruption was widely distributed, occurring about the nape of the neck, forehead, cheeks, posterior folds of the axillae, shoulders, and extensor aspects of the buttocks. The lesions are usually larger than those of lichen spinulosus, and suggest in certain respects lesions of Darier's disease (psorospermosis follicularis vegetans), but no psorosperm-like bodies were detected microscopically. The exact nature of the rare condition described by Dr. Brooke is undetermined, but certain of the cases which have been described since might reasonably be regarded as cases of lichen spinulosus on the one hand, or Darier's disease on the other; and there is some doubt as to the existence of keratosis follicularis contagiosa as a distinct disease.

*Prognosis.*—The patches and groups of lesions persist indefinitely if untreated, but are comparatively easily cured by keratolytics.

*Treatment.*—In many of the cases the patients are anaemic, and the general health is distinctly below par; such cases should be treated by cod-liver oil, iron, or other tonic remedies internally, and by the known methods, physical and hygienic, for the improvement of the health in delicate children. Locally the daily application of an ointment containing 2 per cent of salicylic acid, enforced if necessary by previously scrubbing the patches with soap-spirit lotion applied on a piece of wet flannel, will generally suffice to cure it.

H. RADCLIFFE CROCKER, 1899.
J. M. H. MACLEOD, 1911.

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## DISEASES OF THE NAILS

By H. G. Adamson, M.D., F.R.C.P.

**Introduction.**—The nail is a simple, non-vascular structure made up of highly differentiated cells of one type—a peculiar form of horny cell—welded together to form a semi-translucent, hard, non-elastic body. The nail once formed, there are but few diseases which can alter its structure, and most of the changes which occur in the nails as the result of disease are due to interference with its growth or nutrition while it is still in process of formation, by some affection of the matrix from which it takes its origin, or of the nail bed, with which it is intimately connected. Difficulties arise in the clinical study of affections of the nails because

similar changes are brought about by many different local or general causes. The pathological study of these conditions is also difficult, because histological examination of the nail, and of the nail matrix and the nail bed, is usually impossible during life. In consequence, the diagnosis and pathology of affections of the nails depend, in most instances, upon the existence of the same disease on the skin, or upon the recognition of the presence of some concomitant, and possibly causative, general disturbance.

**Changes in the Nails Common to many Affections.**—Before describing the different diseases of the nails it will be convenient to consider some of those changes which are common to many of them, such as rapid and gradual shedding of the nail; partial separation of the nail from its bed; furrowing and pitting of the surface of the nail plate; friability and splitting; loss of translucency; and alterations of consistence.

(*a*) *Complete shedding of the nail* (onychoptosis) may result from various causes which interfere profoundly with its nutrition by their action on the nail matrix, and which involve also the bed of the nail, so that the nail plate becomes separated not only at its root, but in its whole extent. One of the commonest causes of complete shedding of a nail is a local inflammation involving the matrix and the bed, such as occurs in infective onychia or paronychia due to pyogenetic infection. The nails may be shed as part of a general desquamation in extensive psoriasis, in pemphigus foliaceus, in pityriasis rubra, or after scarlet fever. Fall of the nail may also occur in certain general diseases, such as syphilis and diabetes, and in universal alopecia.

(*b*) *Partial separation of the nail* (onychoschizia) is a condition in which the nail is lifted from its bed without being separated at its root. This may be brought about by heaping up of scales on the bed of the nail from various causes, such as psoriasis, eczema, and ringworm. A single patch of psoriasis, a syphilitic papule, a corn, an exostosis, and a xanthoma papule may also separate the nail from its bed over a circumscribed area. Dubreuilh and others have described an idiopathic or nervous form of "décollement des ongles," which will be mentioned later.

(*c*) *Gradual shedding of the nail* is a very common result of causes interfering with its nutrition at the root, which act gradually, are of moderate severity, and do not involve the bed of the nail to any extent. Properly to appreciate the manner in which many well-known affections of the nail are produced it is necessary to understand what happens in these circumstances. The original nail, instead of being detached from its bed as in complete separation, remains in position and grows forwards on the nail bed in the normal manner. But since new nail is not being produced, or only imperfectly, as the nail grows forward there is left a space, bounded in front by the posterior margin of the original nail and behind by the nail fold. In this space the nail bed may be exposed, or it may be covered with secretion or crusts, or the space may be occupied by an imperfectly formed nail plate. As the original nail

continues to advance, it is followed up by the imperfect nail until eventually the latter may occupy the whole nail bed. The imperfect nail which thus takes the place of the original nail is usually opaque, sometimes thinned, sometimes thickened, ridged transversely and longitudinally, and much softer in structure than the normal nail; keratinisation is incomplete — there is a condition of dyskeratosis. Sometimes the growth of normal nail may be restored before the original nail is completely shed. Then there is left a wide transverse gap, occupied by imperfect nail, between the original nail and the new. These conditions of gradual shedding of the nail, with formation of new but dyskeratotic nail, may result from many causes, such as microbic invasion of the matrix, mycotic invasion, eczema, psoriasis, local syphilitic lesions, and, possibly, from profound disturbances of general nutrition. (See Figs. 158, 159, 166.)

Both after rapid and gradual shedding of the nail, the place of the old nail may be taken by a shrunken stump, or there may not be any attempt to form a new nail. On the other hand, the place of the diseased nail may be taken by a perfectly normal nail.

(*d*) *Abnormal conditions of the nail without shedding* are produced by causes which interfere with nutrition though not to such a degree as to lead to either gradual or rapid shedding of the nail. Amongst these abnormal conditions are—transverse furrows in an otherwise healthy nail; thimble-like pittings; vertical ribbings and fissurings with more or less loss of translucency (reeded nails, onychorrhexis); dead white opacities (leuconychia); and alterations in shape, such as spoon-nails (koilonychia).

**Etiology and Classification.**—Although we are still ignorant of the causation of many nail affections, sufficient is known to justify an attempt at classification on an etiological basis.

It is possible, at any rate, to separate a large group which is due to local microbic infections; and closely allied to these are the less common syphilitic onychias. Another group may be made of those due to physical causes, such as mechanical injury, irritant fluids or chemicals, and *x*-rays; and another, of affections resulting from trophic nerve-lesions. In both of these latter classes microbic infection probably plays an important part. Into another group may be put all the congenital affections of the nails. There still remain the various dystrophies of the nails—transverse furrows, pittings, reedings, opacities—and also the changes associated with definite skin diseases, such as eczema, psoriasis, and alopecia. These may be regarded as due to general metabolic disturbances, or as the result of various toxic conditions of which little is at present known. In describing the various affections of the nails this grouping, which is to some extent conjectural, will not be followed closely, but prominence will be given to the more important clinical forms.

1. **Changes in the Nails due to General or Local Nutritional Disturbances.**—(*a*) *Transverse furrows* or *Beau's lines* are among the most common changes seen in the nails, and occur in various conditions. A

transverse depression of the nail without any alteration of texture is frequently seen after an illness. It represents that part of the nail which was being formed at the time of the disease. It appears from beneath the nail fold a few weeks afterwards, and passes gradually towards the free end with the growth of the nail. A transverse furrow of this sort is thus often an indication of some previous illness, and by its position on the nail the date of the illness can be guessed approximately, judging from the fact that the nail takes about six months to grow through its whole length.

The nails of the thumb, great toe, and the index finger are most often affected, but all the nails may be furrowed. This furrow is well seen after enteric fever, and it is common after influenza, measles, and scarlet fever, but it may occur after any illness. It was first described by Beau in about 1870, and was noted by Sir S. Wilks about the same time. Cases in which the furrows occurred with attacks of sea-sickness have been recorded (Wilks, Hartnell, S. Paget). Marco Treves figures the case of a lunatic with many transverse striae corresponding to repeated organic disturbances.

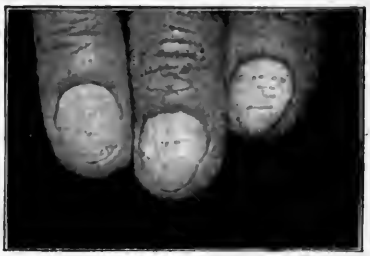

FIG. 154.—Beau's lines. The photograph shews the nails of a patient who suffered severely at each menstrual period, and it will be seen that the positions of the transverse furrows correspond in point of time with the menstrual periods.

(*b*) *Onychorrhexis* or splitting of the nails ("fluted" or "reeded" nails). The name onychorrhexis is applied by Dubreuilh to some cases which, he says, are probably of nervous origin, and which may be congenital or acquired. They are characterised by a thinning of the nail plate which is finely striated longitudinally, as though scratched with sand-paper. In advanced cases the nails are flattened, fissured longitudinally, broken at the free end, thinned, and yield to pressure.

Closely allied, if not identical with this condition, are the fluted, ridged, or reeded nails described by Sir D. Duckworth and others as indicating a gouty habit. Sir D. Duckworth states that this may often be a mere senile change, though excessive ridging may be noted at a very early age. He says that "these fluted lines consist of an overgrowth of the fine linear arrangement which may be seen in many nails, formed on the natural papillary ridges of the subjacent matrix. Associated with this character is a quality of brittleness and general coarseness of the nail structure."

Longitudinal striation and splitting of the nails may also form part of the changes observed in eczema, psoriasis, or syphilis of the nails.

Treatment. — When onychorrhexis is marked, the inconvenience occasioned may to a large extent be obviated by painting the nails with collodion.

(*c*) *Onychoschizia*, or separation of the nails. This term has been

employed by Darier to indicate conditions in which the nails are separated from their bed without being wholly shed. Mechanical separation by scales, etc., in psoriasis, eczema, ringworm, or other affections will be referred to later. Dubreuilh and Frèche have described cases in which separation has occurred without any apparent cause of this sort. Those affected are chiefly women of nervous habit. The separation begins at the free end, or at one corner, and advances sometimes as far as the lunule. There is no alteration of the bed; the nail plate is unchanged, though penetration of dirt beneath the nail may give it a black appearance. This affection may last for months or years with variations in intensity, becoming finally cured or ameliorated, or its place may be taken by hysterical or neurasthenic disorders.

Possibly the cases described by Nevins Hyde as "egg-shell nail" are of the same nature. They all occurred in young women, and a marked feature was the separation of the nail from its bed at its anterior part,

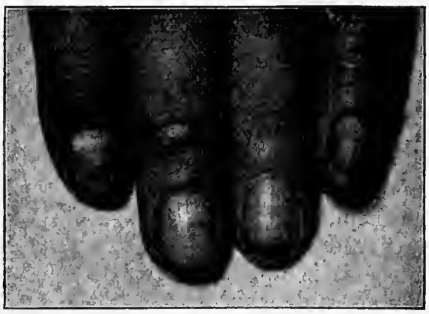

FIG. 155.—Leuconychia striata.

the separated portion of the nail having an opaque "egg-shell" appearance. These patients manicured; and this practice possibly accounted for the white appearance of the freed portion of the nail, for in one patient who did not manicure it was less prominent. These patients were all below the standard of sound health, with unstable circulation and hyperidrosis of the extremities.

(*d*) *Leuconychia.*—Whitish spots and patches, commonly known as "gifts," are frequently seen in the nails. They appear near the lunule as chalky-white spots, or transverse bands, which gradually advance with the growth of the nail towards the free border. They are also called leuconychia punctata or flores unguium. Many observers have regarded them as the result of infiltration of air between the strata of the nail; but this has been denied by Heidingsfeld, who believes them to be due to a failure of the cells at the part affected to undergo normal keratinisation. This he thinks is brought about by slight traumas, such as might be produced in pushing back the "quick," by malnutrition, by febrile diseases, by neuroses, or by any nutritive disturbance of the matrix which interferes with the growth of the nail. Some instances of striation with transverse

white bands (leuconychia striata) have been recorded, and also many examples of complete blanching and opacity of the nail—leuconychia totalis (Figs. 156, 157). Leuconychia is said never to occur in dark races, but to be often well marked in the Hebrew race (Hutchinson).

FIG. 156.—Leuconychia totalis.

(*e*) *Onychogryphosis* or claw-like nail, is the name given to a condition, seen chiefly in the great-toe nail, less often in nails of the other toes, and still more rarely in the finger nails, in which the nail is thickened and curved or twisted into the shape of a horn or claw. The thickening is to a large extent apparent, and is mainly produced by the formation on the bed of the nail of a dense mass of epithelial cells, which lifts up the nail and at the same time binds it firmly to the nail bed. The nail itself is somewhat thickened, ridged transversely and longitudinally, shiny and opaque, and projects upwards, or is arched or twisted. Virchow, who first described the condition, believed it to be due to irritation of the matrix from pressure of boots; but this does not explain all cases. It is commonly seen in limbs affected with elephantiasis or with varicose veins.

The treatment is to soften the nail by prolonged soaking and then to trim off the redundant mass. Or a permanent cure may be obtained by application of the galvano-cautery to the matrix and nail bed.

(*f*) *Median Striation.*—Sir J. Hutchinson has described a condition of the nail in which "there extends down the centre of the nail a strongly-marked ridge." Sometimes the ridge splits into a sort of Y two-thirds of the distance up the nail. All the nails are affected. No cause can be discovered.

As is pointed out on p. 745 the transverse grooves seen in eczema of the nail may sometimes occupy the central part only of the nail plate, and Heller has described as "Eczema striatum medianum unguium" a case in which several nails presented a median groove across which were transverse grooves. He has also recorded two cases of median striation which he regarded as syphilitic—striae longitudinales medianae unguium syphiliticae.

(*g*) *Koilonychia* (Heller) or spoon-nail is a rare condition of the nail in which the sides and, to a less extent, the free end become inverted so as to make the nail concave instead of convex. It begins on one finger,

and gradually involves the others. It has occurred in association with various other conditions: Raynaud's disease; lichen planus; acanthosis nigricans; immersion of the hands in strong potash; and, in some instances, alone. It has also been described as a congenital and familial affection. It has been seen in association with leuconychia totalis. Slight conditions of koilonychia may be met with in chronic eczema of the nail.

(*h*) Increased curvature of the nails forms part of the clubbing of the terminal phalanges of the hands and feet seen in various diseases, especially chronic infective conditions of the lungs and pleurae and congenital heart disease. It is noteworthy that with the cure of the primary disease, such as empyema or bronchiectasis, the clubbing disappears (*vide* art. "Pulmonary Osteo-Arthropathy," Vol. III. p. 64).

FIG. 157.—Concave wearing of the ends of the nails in a child who had long been the subject of chronic eczema.

2. **Affections of the Nails due to Local Physical Causes.**—This heading includes onychia and perionychia following mechanical injury, or associated with certain trades which entail the use of irritant fluids or chemicals. These affections, however, are mainly the result of secondary microbic infections, or arise in connexion with eczema produced by local irritants, and they are referred to under the heading of infective onychia and of eczema. There are two minor affections, the result of mechanical injury, which may be briefly considered: these are "nail biting" or onychophagia, and wearing of the nails by scratching.

(*a*) *Onychophagia* is frequently observed in children, less often in adults. It is merely a bad habit, sometimes associated with evidence of nervous instability. It is often the result of imitation, so that in some schools a large proportion of the children adopt this practice. The free borders of the nails become bitten away, and in severe cases even the greater part of the nail. Physical measures are of little avail in curing the habit, which should be corrected by mental discipline.

(*b*) *Wearing of the nails* ("usure des ongles," Darier) is met with in many forms of manual labour, and also in chronic pruritic affections of the skin, and it thus constitutes a useful indication of long-continued scratching. The free borders of the nails become concave instead of convex (Fig. 157).

(*c*) *Changes in the nails due to x-ray exposures* are secondary to the action of the rays upon the nail matrix and upon the nail bed. By a sufficient dose of *x*-rays the nail matrix may be so damaged that the nail falls entirely, in the same way that the hair falls from the action of the rays upon the hair papilla. This result may be produced by one exposure, or it may be the result of the accumulation of repeated smaller exposures

over a long period. In my experience, the dose required to cause fall of the nail is greater than that required to produce temporary depilation, so that this result cannot occur without damage to the skin, and *x*-ray applications cannot be used as a therapeutic measure to produce fall of a nail. Another effect of *x*-ray applications to the nail bed or matrix is that which occurred in the earlier workers who exposed their hands to smaller doses over long periods, in which the accumulated action of the exposures was not sufficient to produce actual fall of the nail. Here the nutrition of the nails was so affected that the nails became ridged longitudinally, brittle, and often raised up by heaping-up of scales on the nail bed beneath them. In many of these cases coccic infection occurred, and paronychia resulted with subsequent fall of the nail.

3. **Affections of the Nails due to Trophic Nerve-Lesions.**—Changes in the nail may occur after accidental division of peripheral nerves, in syringomyelia, tabes, hemiplegia, Raynaud's disease, and in other nervous affections. These changes are of two classes: those which result directly from nerve disturbance; and those which are due to secondary coccic infection after injuries received in consequence of the parts being anaesthetic.

The former are mostly of the nature of the dystrophic changes, and are of various types, such as transverse furrows, general deformities, twisted or curved growth of the nail, and onychogryphosis. Secondary onychia and paronychia from coccic infection may result in any of these conditions. It is of common occurrence in syringomyelia and in anaesthetic leprosy. But with trophic lesions, either from disease or from direct division of nerves, these dystrophic changes of the nail are the exception rather than the rule.

Many observers regard other dystrophic changes occurring without obvious nerve lesions, such as leuconychia, koilonychia, and onychorrhexis, as the result of nerve disturbance, but there is at present little or no evidence in support of this.

4. **Affections of the Nails due to Infection.**—*Coccic Infections.*—The names onychia, paronychia, perionychia, and panaritium or whitlow are somewhat loosely applied to these conditions: onychia connotes an inflammation of the matrix and nail bed and the changes in the nails resulting therefrom; the other names are used when the surrounding skin or tissues are also attacked. Sabouraud has separated two types of coccic onychia, staphylococcic onychia and streptococcic onychia.

(*a*) *Staphylococcic onychia* or *staphylonychia* occurs in children and in adults who bite their nails, as the result of infection from the mouth. A minute abscess is formed under the angle of the nail at its free border, which is painful for some days, and from which a drop of pus may be squeezed on pressure. The little abscess soon dries and appears as a scaly patch beneath the nail. This scaly mass may be removed with a needle and will be found to contain a collection of staphylococci in its centre. Similar abscesses may continue to form for long periods. The

treatment is to stop the biting of the nails, to clean out the scaly collections, and to introduce a mild antiseptic lotion.

(*b*) *Streptococcic Onychia* or *Streptonychia*.—This is a perionychia rather than an onychia. It is the affection which is described in books on surgery as the most simple form of whitlow, the sub-cuticular whitlow. It may occur as a direct infection, commonly in nurses and doctors, or in children, especially in association with impetigo contagiosa (streptococcic impetigo). It begins as a phlyctenule at one side of the nail, which gradually extends round the nail and along one side of the finger. This phlyctenule is filled with a turbid serum. After a time it breaks, and dries, though continuing to extend at its margin. Cultures of streptococci can usually be obtained from the contents, but more readily from the base of the lesion. In some cases the infection extends to the matrix and beneath the nail, which becomes raised by a sheet of pus, falls, and is replaced after healing of the lesion. Sometimes, after healing of the phlyctenule, there remains a condition which is not described by Sabouraud. The matrix becomes invaded, and there is a gradual shedding of the nail. The part of the nail bed nearest to the root is exposed or covered with a firm yellowish crust, and the basal and lateral nail fold is red and swollen (Fig. 158). The exposed or crusted portion of the nail bed gradually becomes covered with a new but imperfect nail as the old nail grows forward. Eventually the whole nail bed may be replaced by a dystrophied nail; or, after a time, a new normal nail may appear. The treatment for this condition is simple, and consists in the continuous application of boric acid fomentations.

FIG. 158.—Gradual shedding of the nail from streptococcic infection of the matrix, in a boy who had an extensive streptococcic impetigo of the trunk and limbs.

Apart from the two clearly defined types which Sabouraud has separated, there are many clinical forms which may be described as infective onychias, in the production of which pyogenetic infection plays the main part, but the bacteriology of which has not been clearly worked out. Such are: the inflammatory infections of the matrix and of the surrounding parts seen in association with nerve lesions in leprosy, in syringomyelia, and in injury or section of the nerves; those associated with certain trades—in French-polishers, barmen, cigar-makers, paper-makers, workers in soda or potash, in formalin or in acids, charwomen and others; and the suppurating onychia which may occur in connexion with nail changes in *x*-ray dermatitis. In these cases there may be considerable redness and swelling of the tissues immediately around the nail, pustulation of the matrix and nail bed, and shedding of the nail; or the process may be less acute, leading only to a slower shedding of the nail with irregular growth of the newly-formed nail.

The very severe form of onychia, the so-called *onychia maligna*, which is now seldom seen, is probably only a severe and chronic form of infective onychia occurring in debilitated subjects and especially in children. "Onychia maligna" as occurring in children, and described by Wardrop, Billroth and others, was characterised by much swelling of the tissues, so that the finger-end was expanded, with abundant granulations from the ulcerated tissues surrounding the nail and from its bed, and was sometimes accompanied by lymphangitis along the arm. It was of very long duration in spite of treatment by the severe surgical measures then in vogue, such as evulsion of the nail and application of caustics or the cautery. By many writers it was believed to be tuberculous in nature, and others regarded it as syphilitic. On the introduction of antiseptics it was shewn that these cases cleared up rapidly with antiseptic dressings, and the reason that they are now but seldom met with is probably that infective onychias are cured before they reach this severe stage. In 1887 Lucien Frottier described a series of cases illustrating the rapid cure of so-called onychia maligna by antiseptic dressings.

The term "onychia maligna" has also been applied to similar cases occurring in adults, such as those described by Bruce Smith and Preedon in flax-spinners in Belfast (1865-73), debilitated and anaemic girls, whose bare feet were constantly soaked in hot water, contaminated with brass and other metals from the machinery. The great toe was generally attacked with the usual symptoms of acute onychia and perionychia accompanied by much pain.

The best treatment for severe infective onychias is by means of prolonged hand- or foot-baths, any loose portions of nail or dead tissue being daily snipped off with scissors, and exuberant granulations touched with nitrate of silver. With this treatment evulsion of the nail is no longer necessary.

(*c*) *Ringworm of the Nails, Onychomycosis trichophytica.*—Ringworm of the nails is not seen in association with the common small-spored ringworm of the scalp of children, for the *Microsporon audouini* does not attack the nails. Ringworm of the nails may accompany the large-spored ringworms of the scalp, of the glabrous skin, or of the beard, or the nails may be alone affected. The types of fungus usually found are the *Trichophyton endothrix* of violet culture and the *Trichophyton endothrix* of crateriform culture. I have seen one case due to a pus-forming trichophyton of animal origin (Fig. 159).

A striking feature in regard to nail ringworm is its tendency to persist over long periods, cases of twenty years' duration or more having been recorded. It may occur in several members of one family and even through several generations, and some observers (Frèche and others) have maintained that many instances of so-called family dystrophy of the nails have been really endemic ringworm. One or more nails may be affected, generally several, without symmetry or order; it is rarely that all the nails are attacked. The disease may begin either at the free border of the nail or beneath the nail fold. Dubreuilh states that

the skin in the neighbourhood of the nail is always first affected, although the skin lesions rarely persist. The disease may appear first as a dirty-greyish scaly mass beneath the free end of the nail, which gradually

Fig. 159.—Ringworm of the nail. Illustrates the result of invasion of the nail matrix. In this case the fungus was a pyogenetic ringworm of animal origin.

extends under the nail and finally involves the nail itself by direct growth into its substance, the external wall of the nail often remaining unaffected for a long period. In other cases the fungus grows beneath the nail fold and appears to attack the nail matrix. The nutrition of the nail is interfered with, so that the new growth of nail is opaque and friable, while

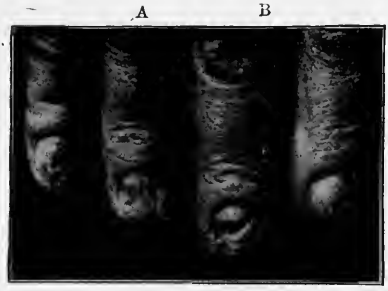


Fig. 160.—Ringworm of the nails of several years' duration. The patient also had ringworm of the scalp which, like the nails, gave cultures of *Trichophyton endothrix violaceum*. On the right hand three finger nails and the thumb nail were affected; on the left hand one finger nail and the thumb nail were unaffected. The ring-finger A shews a nail thickened, ridged, and opaque at its central part; at the sides the place of the nail is occupied by a crumbling mass. The middle finger B shews at the distal part of the nail a semilunar thickened strip of the nail plate resting on a similar crumbling mass. The proximal half shews a new growth of what appears to be healthy nail. (From a photograph by Dr. E. H. Beresford.)

the distal portion remains normal. In either case the whole nail may eventually become involved so that there is a thickened, roughened, opaque, spongy nail, generally raised from its bed by a thick layer of horny scales beneath (Fig. 160). This is the condition usually seen and described, because the observer has seldom the opportunity of seeing the nail in the earlier stages of invasion. In the case illustrated in Fig. 159, however,

under continuous treatment by wet antiseptic dressings new healthy nail began to form after three months. Where the invasion is complete, the condition is indistinguishable from dystrophy of the nail due to other causes, and diagnosis can only be made by examination of scrapings from the fungus, though it may be strongly suspected when ringworm is also present in the scalp or beard. In order to examine a suspected nail, scrapings or, better still, filings should be soaked for some hours in liquor potassae and then examined under the microscope, the fungus appearing in the form of a jointed mycelium.

Treatment.—The best form of treatment is that recommended by Sabouraud, namely, prolonged application of a solution of iodine (iodine 5 parts, potassium iodide 1 part, water 100 parts). This solution is kept constantly applied on cotton-wool covered with a loose rubber finger-stall. The cure occupies many weeks or months. Removal of the nail by surgical measures or by *x*-rays might naturally appear to be a rational method of treatment, but recurrence may take place after evulsion, because a small portion of infected nail is generally left behind at the root. I have found that removal by *x*-rays is impracticable, because the pastille dose, as used for depilation, is insufficient to cause fall of the nail. With a larger dose, a dermatitis of the skin over the nail matrix must result, and, moreover, there is the risk of producing permanent loss of the nails exposed.

(*d*) *Favus* rarely attacks the nails. The lesions are almost, if not quite, identical with those in ringworm of the nails, although in the earlier stages it is said that yellowish opaque streaks may be seen beneath the lateral or free border of the nail. The disease is either preceded or accompanied by favus of the head or body. When this is the case, the recognition of the fungus is sufficient for diagnosis; but when the nails alone are affected, cultural examination is necessary. The treatment is the same as that for ringworm of the nails.

5. **Various Affections of the Nails, associated with well-defined Skin Diseases.** (a) *Psoriasis.*—The nails may suffer in association with an eruption of psoriasis, or they alone may be attacked. The more severe forms occur probably when there is no eruption on other parts. But, as the disease is then more difficult to recognise, other affections of the nails are possibly sometimes mistaken for psoriasis. In some instances diagnosis may be facilitated by the occurrence of psoriasis in other members of the family, or careful examination may reveal a few isolated patches of characteristic psoriasis on the trunk or limbs. Familiarity with the earlier, or less severe, forms of psoriasis of the nails can be gained only by routine examination of the nails in all cases of the disease. The clinical forms are:—(*a*) Punctate pitting of one or several nails; (*b*) a much less common one with an opaque scaly patch beneath the free end of the nail, separating it from its bed at this part. These two forms of lesion appear to be the starting-point of the more severe forms in which (*c*) the whole nail is opaque, thickened, ridged, and brittle.

(*a*) Punctate pitting occurs in a large proportion of cases of psoriasis

Generally the pits are few and affect one or two nails only, though sometimes several nails are thickly dotted with them. The pits are the size of a pin's head or smaller, cup-like, smooth depressions without change in colour or texture of the nail substance (Fig. 161). According to Schütz the red points may be sometimes seen in the anterior part of the lunule, and, as they grow with the nail, become punctate depressions. He supposes that the red points indicate hyperaemic papillae, such as occur in the lesions of psoriasis in the skin. These pits, however, are not peculiar to psoriasis, for they may also be seen in eczema and in syphilis. Those occurring in syphilis are said to be distinguishable by their roughened surface which soon becomes blackened by dirt, but in some cases of undoubted psoriasis and of eczema the pits may be similarly roughened and blackened.

Fig. 161.—Psoriasis of the nails, shewing punctate pittings—a very common condition in psoriasis.

(*b*) Scaly Patch Beneath the Nail.—In a small proportion of cases of psoriasis of the skin there may be seen at the free end of one or more nails, a semilunar opacity produced by a heaping up of scales beneath the end of the nail. This condition is produced by the formation of a lesion of psoriasis on the nail bed (Fig. 162). The scales are thin and loosely packed, and can be scraped away with a blunt-pointed instrument. This condition may be associated with pitting of the nails. Sir J. Hutchinson regards it as characteristic of psoriasis, but it is at any rate closely simulated by the early stage of ringworm, when the latter attacks the nail from beneath its free border. In some instances the scaly patch may appear at the root or side of the nail instead of at its free border, and it has also been noted as occurring beneath the central part of the nail.

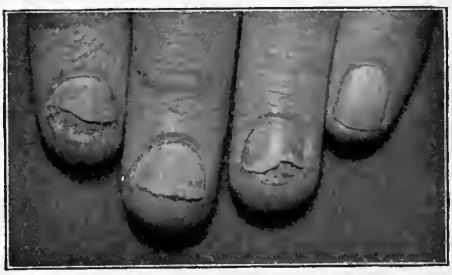

Fig. 162.—Psoriasis of the nail bed, shewing how the fore part of the nail is undermined and broken away by the formation of a patch of psoriasis on the nail bed.

The more advanced forms of psoriasis of the nails are probably an exaggeration of the two earlier conditions; the pits become more numerous and deeper and blended together, and the scaliness of the bed of the nail extends. The nutrition of the nail is interfered with until the whole nail becomes irregularly grooved on its surface, opaque, brittle, and lifted up by scaling underneath. The state thus produced cannot be distinguished by its appearance alone from ringworm of the nails or from

other dystrophic conditions, and can only be diagnosed as psoriasis by the presence of that disease elsewhere on the body (*vide* also p. 366 et seq.).

The treatment of psoriasis of the nails is not very satisfactory. The administration of arsenic has been recommended by many authorities, especially by Sir J. Hutchinson, but it is far from being a specific remedy, though it occasionally appears to succeed. Local treatment is best carried out by the application of an ointment of tar or of salicylic acid pushed beneath the nail and under the nail folds, and by the wearing of rubber finger-stalls for a long period.

(b) *Eczema.*—The nails are frequently affected in association with eczema of the hands and fingers, but there are no changes in the nails characteristic of this disease. There may be merely punctate pittings, the result of slight eczema of the bed of the nail, and indistinguishable from those occurring in psoriasis. Or the nail may be marked with a series of irregular transverse grooves or ridges, one behind the other, occupying the central part of the nail or extending from border to border, and indicating repeated disturbances of nutrition from eczema of the matrix. Sometimes there are longitudinal fissurings, superficial or extending through the whole thickness of the nail. These changes may occur singly or together on one nail. In severe and acute eczema the whole nail may be loosened by exudation from the nail bed, and the nail may be shed. A condition occasionally occurs as the result of an interference with the nutrition of the matrix which is more severe than that necessary to produce mere transverse ridgings; this is a gradual shedding of the nail, with a new but deformed nail growing up behind, the new dystrophic nail eventually occupying the whole nail bed. Still another appearance is that of heaping up of scales beneath the nail towards its anterior part and at the sides, produced by a parakeratosis of the nail bed in chronic eczema. Finally, by a combination of many or all of these changes a condition may be produced in which the nail is opaque, thickened, pitted or transversely ridged, and everted at its lateral and anterior margins by a compact, hard, scaly mass beneath.

Fig. 163.—Irregular transverse groovings of the nail associated with eczema of the fingers.

It is probable that the matrix and nail bed are always involved secondarily to eczema of the skin in the immediate neighbourhood; but the nail may remain affected after the eczema of the skin has cleared up. In cases of acute eczema there may be much swelling and redness of the parts bounding the nail, and this is often the case especially in "trade eczema."

Diagnosis.—The affections with which eczema of the nails may be confused are psoriasis, ringworm, syphilis, and the results of coccic infections. A diagnosis can only be made with certainty in the presence of eczema on the fingers or elsewhere.

Treatment.—In acute cases of eczema of the matrix and bed with much inflammation and secretion the hands may be soaked in bran baths, and dressed with lint soaked in normal saline solution, Lassar's paste being used when the acute symptoms have subsided. In chronic eczema of the nails the eczema of the surrounding parts must be treated, but it is of course impossible to modify the already altered nail. With a more healthy condition of the surrounding parts the new nail will generally grow normally.

(c) *Alopecia.*—Sabouraud says that changes occur in the nails in most cases of generalised alopecia areata, and in half of the more severe cases, and that traces are often seen in the more benign forms of alopecia areata. This certainly does not accord with my experience, which is that nail changes are of great rarity in all forms of alopecia areata, severe or benign. Sir Dyce Duckworth states that the nails are often brittle in alopecia areata. The changes mentioned by Sabouraud are:—(i) White striae, or leuconychia punctata, which he says are very commonly seen; and, in certain cases of general alopecia areata, leuconychia totalis. (ii) Pitting of the nails is a frequent deformity, sometimes one nail only, sometimes several or all. This pitting may be limited to a single transverse band on each nail. (iii) Vertical striation with notching of the free end of the nail—onychorrhexis of Dubreuilh. The nails split in their long diameter, the splits becoming blackened from dirt. At the same time they split vertically by cleavage. Darier and Le Sourd have described a case of alopecia areata becoming universal, in which the finger nails were pitted for the most part, and one nail presented an appearance of mica, as though infiltrated with air. Dr. P. S. Abraham shewed at the Dermatological Society of Great Britain and Ireland a case of alopecia areata in a young woman who presented a porcelain-like pallor (leuconychia) and also pitting of the nails of the fingers, some of the toe nails being flecked with white areas. Brocq and Sabouraud, who were present, referred to similar cases of alopecia areata with white nails. Audry has described two cases of alopecia areata in which there were punctiform depressions on the nails, giving a granite-like appearance. Some of these nails were also grooved, with the free borders brittle or broken, and some had fallen and were replaced by hyperkeratosis of the nail bed. Crocker, Morris, Wende, and Leven have recorded somewhat similar cases, and Arnozan a case of spontaneous fall of the nails of the hands and feet three years after an attack of alopecia areata of the beard.

(d) *Other Skin Diseases.*—The nails may be shed or dystrophic changes may occur in pemphigus of all forms and in pityriasis rubra, and changes may occasionally be observed in lichen planus and in Darier's disease, but there is nothing characteristic about these affections and they form only an unimportant part of the more general skin eruption. Fig. 164 is a photograph of the nails in a case of epidermolysis bullosa under the care of Dr. Norman Meachen. The growth of nail is normal, but the distal part of the nail has been separated and destroyed by repeated injury to the

bed of the nail at this part. Fig. 165 shews a dystrophic condition of the nails in a patient who had malignant disease of the stomach. The nails of the first and little fingers were almost gone, and what little remained consisted of a rough brittle growth. The cause of this condition, which was of many years' duration, could not be ascertained.

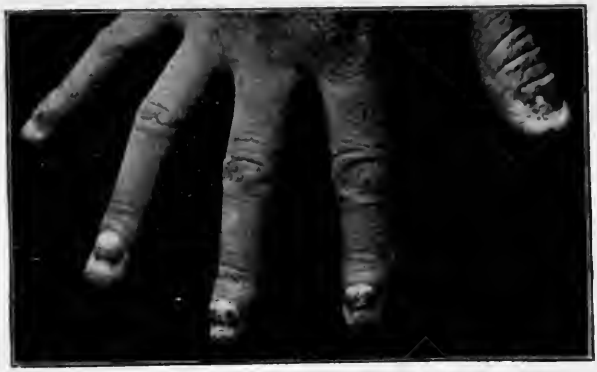

Fig. 164.—The nails in a case of epidermolysis bullosa. (Meachen.)

(e) *Syphilis* may attack the nails or the parts with which they are intimately connected in various ways, though none of these affections is common. They may be conveniently described as chancre of the nail fold, dry onychia, the isolated papule, and syphilitic paronychia.

Chancre of the Nail Fold.—This is not really a disease of the nail, but it is mentioned here because it may be mistaken for ordinary infective

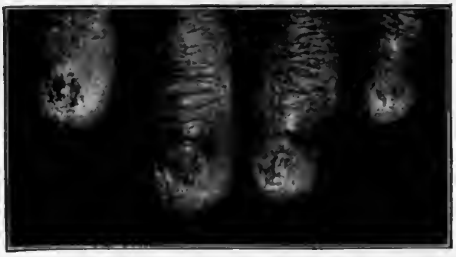

Fig. 165.—Dystrophy of the nails.

onychia. The lesion may sometimes be so slight that it may be overlooked or not regarded seriously. It sometimes appears as a persistent fissure in the lateral nail fold which, on careful examination, is found to be indurated, and to be associated with an enlarged and hard epitrochlear gland. In other cases there may be a hard, oblong, red and scaly swelling in the nail fold without any suggestion of ulceration, and sometimes the whole finger-end may be swollen. Chancres in this situation are seen most often in doctors or nurses.

Dry Onychia (Onychia sicca syphilitica; Scabrities unguium syphilitica;

onyxis craquelé (Fournier).—Certain conditions of the nail are described as occurring in syphilis, in which the nail plate only appears to be involved. Some observers regard these as the result of general nutritional disturbances, others as probably due to local disease of the matrix or nail bed. All are agreed that they are rare, and that they may appear at any time during the course of syphilis, from a few months to many years after infection. As evidence of their rarity, it may be mentioned that Heller met with these changes three times only among 8000 to 9000 cases of syphilis specially examined for affections of the nails. A. Fournier apparently regarded them as less rare, and, unlike other observers, believed them to be more common in women than in men. The changes consist in: (i) A peculiar friability of the free border of the nail, so that it splits and breaks on the least injury, or when any attempt is made to trim the nail; (ii) a pitting of the dorsal surface of the nail, the pits being arranged more or less in a linear series from the root forwards. The pits begin as

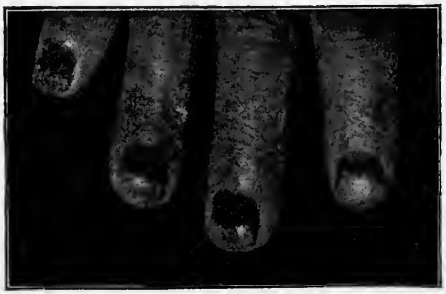

Fig. 166.—Onychia sicca syphilitica; early stage.

whitish points in the nail surface, which can be readily dug out with the point of a knife, and which eventually leave roughened pits which become black from dirt and are in contrast with the smooth pittings usually seen in psoriasis and eczema of the nail; (iii) as these changes advance the whole nail may become involved, taking on an opaque, yellowish, friable aspect, which has been likened to the pith of rushes; (iv) in a few instances of dry onychia syphilitica a hard wedge-like thickening of the free ends of the nails has been described; (v) in other cases the nail has become detached from the bed, or shed entirely, with or without preceding dystrophic changes.

The separation or shedding of the nail is painless, and a patient may lose the nail without noticing the process. One or several nails may be affected by these dry onychias. None of the changes can be said to be characteristic, and a certain diagnosis is impossible unless other signs of syphilis are or have been present.

The accompanying photographs (Figs. 166 and 167) are from a case of onychia sicca syphilitica. The patient was a man, aged fifty-six years, who had, when first seen, a squamous syphilide on the scrotum, flat condylomas, and shallow ulcerations on the tongue, and the condition of

nails seen in Fig. 166, namely, a proximal portion roughened and opaque, growing up behind the distal normal portion. Six months later the dystrophied nail had entirely taken the place of the normal nail, as in Fig. 167, and the nails were roughened, pitted, and brittle throughout.

Fig. 167.—Onychia sicca syphilitica; nails completely involved; from the same case as Fig. 166.

The condition of the nails represented in Fig. 168 has not, I believe, been hitherto described (1). The tendency to ridging and splitting was like that seen in other cases of onychia sicca syphilitica, but the nails were peculiar in being extraordinarily thin and papery.

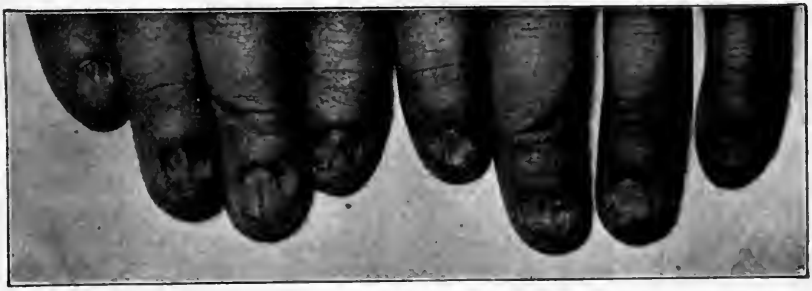

Fig. 168.—Syphilis of the nails. The patient, a man aged thirty, had contracted syphilis one year before. All the nails, both of the fingers and toes, were affected. They were thinned, and so soft that they yielded to slight pressure. They were split at the free ends, and cracked and folded into longitudinal ridges. (Mr. J. E. R. McDonagh's case.)

The solitary papule on the nail bed is somewhat less rare. It occurs generally in the early stages, and often in association with papular or lenticular lesions elsewhere. When arising on the bed of the nail, the overlying portion of the nail appears reddened from the papule shewing through, then opaque, and finally the opaque patch can be dug out, or crumbles out, leaving a rugged crateriform hollow in the nail. This hollow advances with the growth of the nail until it disappears at its free margin. In other cases the papule is partly on the nail border and partly on the nail bed, so that a semicircular lateral erosion of the nail takes place (Figs. 169, 170).

The third and most important of the affections of the secondary

and later stages of syphilis is paronychia syphilitica or syphilis ulcerosa unguium. Generally several nails are affected. The first changes are redness and swelling of the parts around the nail, with some pain, though

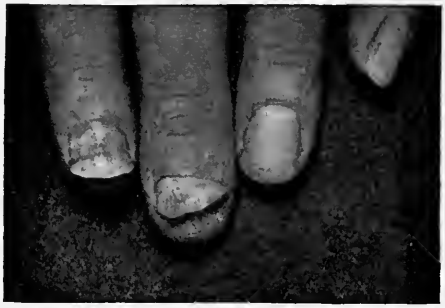

FIG. 169.—Syphilitic disease of the nails. (From a case under the care of Mr. J. E. R. McDonagh.)

generally less than in infective paronychias. The epidermis bordering the nail becomes undermined by sanious sero-purulent secretion, forming a horse-shoe-shaped ulceration around the nail. The inflammation extends

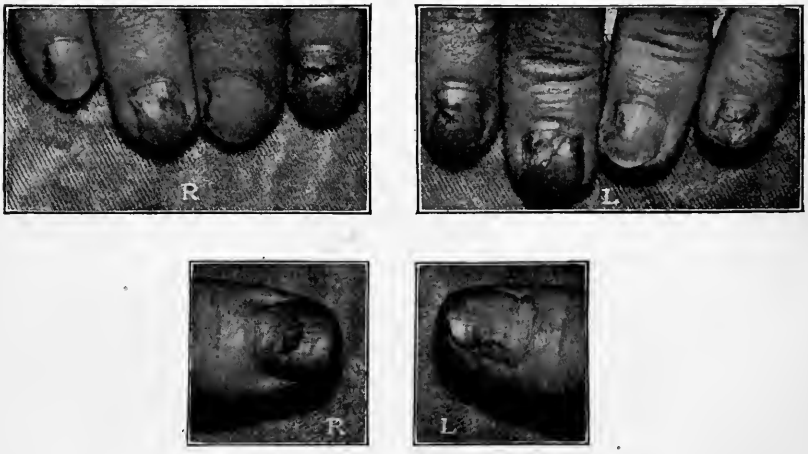


FIG. 170.—Syphilis of the nails. The lesions are the result of the formation of papules on the nail bed, the nail plate immediately over the papule becoming secondarily affected. The little finger of the right hand (R) and the ring finger of the left hand (L) shew early papules towards the lateral margin of the nail. The thumb of the right hand (R) shews complete perforation of the nail plate subsequent to the formation of a papule at the central part of the bed. These lesions of the nails appeared, about four months after infection, as part of a general papular eruption which involved the palms and soles. They persisted after the general eruption had faded. (Mr. A. Shillitoe's case.)

to the matrix and nail bed, the nail becomes loosened, and pus oozes from beneath it. Eventually it becomes blackened, and falls, exposing an ulcer with granulating surface and fetid discharge. The thumb, the

first finger, and the great toe are most often attacked, probably because they are most exposed to injury.

The Diagnosis of Syphilis of the Nail.—In the case of onychia sicca diagnosis from other nail conditions must be impossible in the absence of other evidence of syphilis. Onychia associated with periungual lesions must be distinguished from periungual psoriasis with nail lesions and from infective onychias. Here, again, the diagnosis rests mainly on the presence of syphilitic lesions elsewhere.

The treatment of syphilitic diseases of the nail is that of syphilis generally, but these affections are often obstinate to internal medication, and the best results are obtained by local treatment with mercurial plasters as recommended by Kaposi. The mercurial plaster "must be wound, in the form of a long strip, round about the ungual segment of the finger or toe, so that it compresses the fold of the nail. It then acts through the skin of the fold of the nail, specifically and by the continuous pressure, as an absorbent, on the infiltration of the matrix and of the bed of the nail, and subsequently effects an improvement in the growth of the nail." This method may be used either in onychia sicca or in paronychia, but if there is pustulation this must first be removed by wet dressings of gauze soaked in sublimate solution. In pustulating onychia the nail should not be removed if this can be avoided, for the new nail will be of better growth if the old falls gradually and spontaneously.

Similar changes in the nails—onychia sicca and paronychia—have been observed in congenital syphilis.

6. **Congenital Affections of the Nails.**—Of the various congenital affections of the nails none is very common. They sometimes coexist with other degenerations; they are often hereditary or familial; and all are incurable. Like other congenital malformations, they do not always appear at birth, but later in life.

*Absence of one or several Nails* (*Anonychia*).—Wilson, Jacob, Eichhorst, Croker and others have described cases. Sir J. Hutchinson mentions two cases, in a brother and sister, with congenital alopecia and absence of nails, in whom the nails, but not the hair, appeared at seven or eight years of age. Montgomery noted a case of repeated shedding of nails since birth with a history of a similar affection in some of the patient's ancestors.

*Rudimentary nails* (epidermic nails) are also described, the nails persisting in the state of infantile nails of adult size.

*Supernumerary nails*, *congenital onychogryphosis*, *congenital spoon-nails*, and *congenital leuconychia* also occur.

Several writers have described a form of *hypertrophied nail*, or rather a dystrophied nail, with heaping up of a dense horny mass beneath a thickened nail which projects at an acute angle with its bed. These have often been familial affections and associated with other degenerations. Such cases are those reported by Nicolle and Halipré, in which thirty-six members out of a family of fifty-five were affected. Allan Jamieson, Garrick Wilson, Sympson, C. J. White, and T. C. Fox have recorded

similar cases. Probably Hebra's and Unna's hyperkeratosis subungualis is of the same nature. As already mentioned on p. 741, Frèche has called attention to the occurrence of family groups of cases of ringworm of the nails, and he believes many so-called congenital and hereditary hyperkeratoses of the nails to be onychomycoses.

**General Remarks on the Diagnosis of Affections of the Nails.**—To give a name to any abnormal condition of the nails is generally not difficult. But a diagnosis means more than this; it involves the naming of the disease, local or general, upon which the changes in the nails depend. To some conditions, such as leuconychia and koilonychia, we can do no more than affix names. Others, as vertical ridgings (reeded nails), friability and splitting of the nails (onychorrhexis), and partial separation of the nail at its free end are in some cases to be regarded as due to general nutritional disturbance, often of a vague nature. Transverse groovings are more definitely related to antecedent disturbances of health. Other changes in the nails are obviously part of some general skin affection, such as pityriasis rubra, pemphigus vegetans, epidermolysis bullosa, universal alopecia. Those which present the most difficulty, and which are at the same time of most importance, are the changes in the nail due to eczema or psoriasis, those due to pyogenetic or mycotic infection, those associated with syphilis, and those of congenital origin. These changes are in many cases so similar that it is generally impossible to arrive at a correct diagnosis from the appearances of the nails themselves, and often it is only in the presence of other evidences of the suspected disease that a definite conclusion can be arrived at. A point to be strongly insisted upon is that very careful examination should be made for the ringworm fungus in all cases of marked dystrophy of the nails of long duration, even though the evidence seems in favour of some other cause.

H. G. Adamson.

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