

**Ichthyol and resorcin as representatives of the group of reducing remedies
/ by P.G. Unna.**

Contributors

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ICHTHYOL AND RESORCIN

AS

REPRESENTATIVES OF THE GROUP

OF

REDUCING REMEDIES.

BY

DR. P. G. UNNA.

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1890.

INSTITUTION AND RESOURCES

INTERNAL CIRCULAR MEMORANDUM

RECOMMENDATION OF THE BOARD

The Board of Directors has considered the report of the Committee on the proposed changes in the organization of the institution and has recommended that the same be adopted.

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INTRODUCTORY REMARKS.

THE following pages appeared in 1886 as a number of the "Dermatologische Studien," edited by Dr. Unna, of Hamburg. The views here formulated as to the nature of the action of certain remedies, and the principles of treatment to be derived therefrom, were at that time new. They have, however, stood the test of trial and been adopted, practically without contradiction, in theory and practice by many specialists and some in general practice.

Unna has in this article, as in others, taken the opportunity, which the narration of his clinical experiences affords, to more definitely characterize or describe, for the first time, some rare and but little known dermatoses. These interpolations have not to-day the same value for the general practitioner which they originally had, although even now the pharmacological explanations must interest all who desire a rational therapy.

To the specialist the respective questions touched upon and their further development, since the appearance of this monograph, are sufficiently well known; he is aware that the discussion as to the diagnosis of the skin affections here considered is constantly going on and still unsettled. The perusal of this article can indeed hardly fail to incite, even those who do not fully agree with the views advanced by the able author, to more careful thought and extended observation in this still comparatively new field of knowledge.

The fact that the labors of Unna do not appear to be sufficiently known and appreciated by the mass of the profession

—especially here in America—seems to justify an English translation of this article, which contains so much in suggestive thought that is new. The translation is almost literal. No attempt at excellence of style has been aimed at. Only a few elisions have been made, for the most part at the close of the article.

With these few words of introduction and explanation, this translation of the work of my friend and colleague is offered, in the hope that it may serve to make the profession at large better acquainted with the writings of one who has labored so indefatigably and so well in the field of Dermatology.

THE TRANSLATOR.

ICHTHYOL AND RESORCIN

AS

REPRESENTATIVES OF THE GROUP OF REDUCING REMEDIES.

IN a work upon skin formation and cornification ("Dermatoplasie und Keratoplasie" *), I was the first to call attention to the surpassing importance of a class of remedies, some of which were examined pharmacologically some time ago, and are now in practical use. The originality lay in the grouping together of these partly old, partly new remedies, a classification which, like all pharmacological divisions, could, as a matter of course, only consider one material and especially prominent peculiarity of the medicaments thus grouped. In order, from this uniform point of view, to make the action of these agents more comprehensible and their application easier and safer, I called them "reducing remedies," because one of their chief effects appeared to me to be an abstraction of oxygen, and therefore a reduction effect. This abstraction of oxygen is with some of them a chemical process,—which was long since pointed out,—inseparable from their nature, as with sulphuretted hydrogen, pyrogallol, chrysarobin, and sugar. With other remedies of the same class the exact proof is still wanting, yet, from the results of their clinical use, not the slightest doubt exists that these likewise are very important reducing agents in our hands,—*e.g.*, the salts of ichthyol acids and resorcin (brenz catechin, hydroquinone). The following pages are intended to show the pharmacological unity, in so far as clinical observations will do this, and to extend the theoretical and practical

* S. Berl. Klin. Wochenschr., 1883, No. 35.

knowledge of the less known among these substances, especially of the ichthyol derivatives and resorcin. The clinical experience to which I refer, and through which, in late years, I have become acquainted with the strict unity of these agents, has been acquired for the most part by their application upon the healthy and diseased skin and their exhibition internally per os. They are so similar that I no longer hesitate to proclaim their analogous action from the clinical stand-point alone, even if the chemical process should not prove throughout as perfectly analogous. As I regard the action of pyrogallol, the reducing agent *par excellence*, as especially typical and characteristic for the entire group, I desire to maintain, for the future, as completely justified, the name of "Reducing Agent." The effect of all these substances when applied to the external integument will be discussed under these heads: first, their action on the unbroken skin; second, upon the cutis exposed or laid bare; and, finally, their action upon parasites of the skin. Experience has taught me that the action of these substances upon the cutis covered with normal epidermis is very different, and for all of them analogously different, according to whether the quantities considered are small and superficial, or large and deeply penetrating in their effects. This divergence appears in equal proportions with all reducing agencies; it does not depend upon the particular peculiarity of the remedy, but lies in the nature of the artificial reduction of living matter. As a matter of course, the quantities of the medicament under consideration are special in every case, and in part very different. The weak dose of one remedy may be greater than the strong dose of another, even if the quality of the action is very similar in both. The weak action shows itself first, in a change of the horny layer; this becomes thicker, denser, and harder, while the cornification extends into the deeper tissues with uncommon rapidity. Many layers of non-cornified prickle-cells are added to the normal horny layer; and these are replaced, very probably in the same proportion, by new formations from the undermost layer of prickle-cells.

If weak doses of the reducing agent operate uniformly for some time, a separation finally occurs within the horny layer,

into an upper, more or less dark, dead portion, which corresponds to the original loose horny layer which was penetrated by the remedy, and a lower, light-colored portion, which has, meanwhile, been formed anew, from the prickle layer, under the influence of the remedy. The separation between both layers is, for the most part, easily effected, and without trouble we draw off the old horny layer, perfectly whole and of the thickness of a sheet of paper. These phenomena, which can be defined as an artificial cornification, are very easily explained by my theory of reduction. I believe that I have proved* that the immediate effect of the withdrawal of oxygen upon the epithelium of the skin consists in the cornification of the same; *vice versa*, with each cornification process, the possibility of a reduction must be granted, and in no other case can it be granted. I will call the final effect of the more intense process of cornification, under the influence of reducing substances, the "exfoliation of the horny layer."

Intimately connected with the above-mentioned phenomena stands another which hitherto has not been sufficiently connected with the processes taking place upon the horny layer,—viz., pustulation. The appearance of pustules, and especially of folliculitis upon the skin, we have been wont hitherto incorrectly to associate exclusively with a perifollicular formation of pus. This is undoubtedly necessary, and just as necessary to the phenomena of pustulation is an abnormal closure of the mouths of the follicles by the horny layer. Henceforth we may cease to give credence to the old fable of the artificial closure of the follicles with extraneous dirt and the residuum of ointments, etc. If the skin does not possess the means of bringing its excretions upon the surface, despite all external dirt, it would be in a condition of permanent closure with all persons whose entire body is not daily washed with soap. That which closes the follicles, and thus leads to retention of secretion and pus, lies in the skin itself and in the horny layer. Every condition which tends to a firmer union of the cornified cells (a reducing agent in weak doses acting specially in this way) closes the follicles, and

* S. A. "Über Haut u. über Hornung," *Berl. Klin. Wochenschr.*, 1888, No. 35.

leads, eventually, to follicular inflammation; this, however, probably only takes place when the follicles are at the same time infected with definite pus-germs. This is the result with sugar circulating in the tissue-juices in diabetes,—with vapor of tar, pyrogallol, and chrysarobin in the vicinity of the places treated by these remedies, and with sulphur in too weak doses in acne, etc. It is high time that we give to the living skin its rights, and do not continue to treat it as a dead, artificial covering (of the body). Therefore we see that not only pus formation itself is a part of the weak action of reducing agencies, but the retention of the pus in the excretory canals of the skin (which normally are open) is a preliminary condition of every pustulation process.

If, now, the action of the reducing agent in weak does extends into the deeper tissues, we notice an influence upon the blood-vessels which we will designate, for the sake of brevity, a "size diminution." The matter in question is not a temporary musculo-motoric contraction of the arterioles, as so often occurs from reflex action, but a permanent diminution, narrowing, and shortening of the entire system of blood-vessels,—arteries, capillaries, and veins. This influence can of course be best followed with the eyes in those conditions in which the vascular system is enlarged beyond the normal, whether it be an acute infectious process (erysipelas) or a chronic infiltration (lupus or angioneurosis). This influence is less easily seen, but always distinct, on those portions of the skin which are normally redder, as, for example, the face. In view of the importance which we, since Cohnheim's experiments, put upon the integrity of the vascular walls in each form of inflammation, it is not hard to understand that this shrinking, or diminution in size, of the general vascular system must lead to a cessation of the inflammatory process (erysipelas, eczema), and likewise to a reduction of the swelling of such tissues as have been attacked by inflammatory oedema (trauma or collateral oedema). The weak effect of the reducing agent, which is necessary to produce this result, is generally secured in this way,—viz., that the agent, used either in weak or strong doses, is applied upon the surface of the normal epidermis. The

blood-vessels are, in such cases, sufficiently far removed from the remedy to be only gradually subjected to its influence; we must always remember that there are tender spots on the skin (eyelids and penis), especially irritable vascular areas, and constitutions which respond with the symptoms of the intense action even when the application has been made upon the normal epidermis and the dose was weak. Can we then understand that this universal diminution in size of the vascular system is an effect of a reducing agent? I think so. It is for me the analogue of cornification, by reducing agents, on the surface.

The endothelium nourished by the oxygen derived from the blood—I might almost say spoiled with it—dries and shrinks, just like the prickle-cells of the epidermis, if the oxygen is withdrawn from them from without. With a complete withdrawal of the oxygen, as we shall see later when discussing the effect of strong doses, the endothelium becomes fatty and degenerates, in the same manner as the young cells of the epidermis, and a decided stream of inflammatory lymph pours forth through the vessel walls, which have been thinned and irritated in a high degree. This result, visible to the naked eye, of a weak reducing action upon the vascular system is the opposite to the four well-known symptoms of inflammation, and consists in (1) diminution of heat, (2) reduction of swelling, (3) paling of the tissues, and (4) relief, eventually permanent, of painful sensations. The reducing agents show upon the peripheral nervous system also, just as upon the vascular system, a very distinct effect, which consists, when their action is weak, in an immediate quieting of the nerves and cessation of pain.

Whether, however, a direct chemical influence comes into play I shall not venture to discuss; but surely the indirect effect, through the shrinking of the stretched and inflamed parts, is sufficient to accomplish a diminution of pain. It is a universal truth that each sensation—and the same holds with painful sensations—comes so much the more sharply to the consciousness the higher the tissue pressure under which the affected portions stand. Our most sensitive tactile regions are,

with this in view, protected by being embedded in a pillow of connective tissue which is free from tension,—*e.g.*, the fingertips and ball of the hand.

What we call strain of attention, whether it be by listening, by smelling, or by touch, is a voluntary tissue tension brought about through the muscles. Likewise, every one knows that, the conditions being otherwise alike, pus formation—*e.g.*, a boil—is, by so much, the more painful the greater the resistance which the surrounding tissues exercise. So the fact seems to me easily explainable, that a diminution of pain, previously present, follows the action of all reducing agents in the same degree as the shrinking and drying progresses, and that, *vice versa*, this is wanting if the weak action of the reducing agent is changed into the opposite.

It is quite different with another nervous phenomenon, which we observe upon the skin,—*i.e.*, itching. The sensation of itching is such a complicated one, partly dependent on chemical influences, and the explanation of the relation between it and the application of reducing agents is so very dependent upon the theory of itching in general, that I could not, in this article, discuss it without a very wide deviation from my subject.

I relinquish unwillingly the description of this interesting subject in this place, in order, when a better opportunity offers, to devote to it a study which shall go deeply into the subject. Yet I will mention this much of the fact, that the sensation of itching stands diametrically opposed to the sensation of pain. The weak effect of a reducing agent coincides in most cases with the excitation of itching; the strong, with a quieting of the sensation of itching and excitation of the sense of pain. Nevertheless, there are in both cases many exceptions, dependent upon special conditions, which can only find their explanation in an exhaustive theory of the sensation of itching.

We have finally to call attention to a coloring of the horny layer, a universal peculiarity of reducing agencies, in a greater or less degree, which has, I am sorry to say, not yet been as well studied from the chemical stand-point as it ought, although it has been known to the dermatologist for about six years. It deserves such chemical study in the highest degree. If the

particular conditions of this coloration were known to us, we should possess, with this knowledge, not only valuable indications for dermatological practice, but also interesting explanations of the chemistry of the skin, especially of the secretions, and a new field of labor would be opened by this means for diagnosing these latter processes, which as yet are so little known from a pathological stand-point. The best known of all is the coloring of the horny layer under the influence of chrysarobin. While this is reddish brown with a blue tinge,—that is, speaking more exactly, copper colored,—the horny layer, colored by the pyrogallols, is yellowish brown, or even black. Resorcin used in the form of an ointment produces in the horny layer only a dirty-yellow color, but in plaster form a reddish brown, as do brenz catechin and hydroquinone. The shade of the ichthyolized layer can be characterized as a yellow-brown, very like the appearance of the skin burned by the sun. With a long-continued use of sulphur the skin takes on a smoky, dirty appearance, a change in color which the patient vainly seeks to remove with water and soap.

What we, up to the present time, know as the most general condition for the production of these changes in color amounts really to a long-known fact,—that they are all promoted by alkalis, diminished by acids, and of themselves disappear. A number of daily observations in dermatological practice serve as illustrations for this. Pyrogallol brings out on the scalp, through the presence of the sebatic acid, the black color much more slowly than on the non-hairy parts. A single alkaline bath with soap is sufficient to call forth, in *optimo forma*, the black color of pyrogallol, which either is as yet wanting or present in a slight degree; *vice versa*, this black coloration is hindered by the simultaneous use of citric acid, and the pronounced blackening itself can be partially removed by lemon juice. Skins predisposed to erythema and perspiration—that is, in general, sensitive skins which, according to my observation, frequently give alkaline reaction of the surface—respond most quickly and with more intense color to these substances. A combination of zinc oxide, or any other basic substance, with the medicaments produces on the skin everywhere and at once

a deep blackening; the same occurs with the milder remedies, as resorcin. These examples can be multiplied *ad infinitum*.

Notwithstanding, I believe that yet other factors, known and unknown, play a part in the process; for example, the thickness and the quantity of moisture of the horny layer, its transparency, etc. It is, for example, striking that, in general, the horny layer of the palms always undergoes a more rapid and more intense blackening than that of other parts of the body, a fact which cannot be well explained through the reaction of the secretion of the skin alone, but is rather explained through its strict analogy to the especially rich blackening which silver salts produce upon the horny layer of the palm of the hand, which indicates that, with each deeper coloration, processes of reduction also play a *rôle*, as they become extended through the thicker horny layer. These artificial colors have, therefore, without a doubt, a relation to certain physiological and pathological colors of the horny layer, which I have shown, in the place just cited, to be a result of a more or less decided collection of a pigment peculiar to the horny substance; that is, the "horny substance color." Here belongs the color of the hair, varying from light yellow to an ebony black, depending upon whether this pigment is diffusely spread out in the hair-cells or not. Likewise the diffuse color, and the brown granular accumulations found between the horny cells of the comedo heads (*Virchow's Arch.*, Bd. 82, p. 175), concerning which I have elsewhere shown that they are not dirt, for which, I am sorry to say, they still pass in most text-books, though certainly without proof.

In a certain article ("Über das Pigment der Menschlichen Haut") I have produced evidence that the matter in question, in reference to this horny layer, is a reduction product provided by the horny substance itself, which in minute subdivisions is colored yellow, but in larger masses is brown, or even black, and is oxidized by peroxide of hydrogen, with fading of the dark color. I therefore assume, as a logical consequence of this conception, that this reduced body, the horn color, appears under the influence of the reducing agent in a greater or less quantity; and even if it does not influence the shade, still it

fixes or influences the depth of the colors observed. It must be thoroughly understood that, in spite of this common action, there are very many shades and modifications of colors produced by the use of the different reducing agencies.

The following condition is specially worthy of note for a future theory of this coloring process, which is that a diminution of the tendency of the horny layer to take on color appears with the passage of time, provided that the reducing agent acts uninterruptedly upon the skin. It appears as if, through the intense blackening of the skin, a material component of the color is withdrawn, which is not so rapidly supplied again as to enable a new action of the agent to cause just as decided a blackening as before. I have repeatedly observed, after a long use of chrysarobin, that not the slightest specific color appeared; also, after excessive ichthyolization of the skin, that pyrogallol no longer produced the same grade of customary blackening, etc. Moreover, it is a universal observation that, by the continuous use of ichthyol preparations, the horny layer, after a transient yellowing, takes on again its normal white. Only when the opposing conditions are all understood shall we obtain a satisfactory view of the result of the use of these remedies upon the pathological processes of the skin; upon the noticeable difference that in some diseases the healthy skin is colored while the diseased portion is discolored (psoriasis, herpes tonsurans), while in others exactly the opposite appears (pityriasis versicolor, lepra).

The strong action of our remedy upon the normal horny layer is not different from that of the weak action. Certainly a thickening, densification, and drying of the horny layer into a parchment-like membrane appears much more rapidly than under the weak action, and with this the strong action terminates. So far as the horny layer alone is concerned, the result of the weak and strong action is the same; but when the action is more intense, other processes are united, which later completely change the picture. The prickle layer is not, as under the weak action further cornified, but immediately degenerates and softens. An extensive eruption of blebs appears, in which the blebs themselves are marked by their thick-walled horny

membrane. The same action then affects the papillary blood-vessels, and causes injury of the vessel walls, great exudation, and finally migration of pus-corpuscles. The horny layer constantly becomes more deeply undermined, and finally is thrown off an entire membrane. This whole process may consume, where a strong pyrogallic "mull plaster" is used, twelve hours; with the strong resorcin and ichthyol preparations, some days, or even weeks. It is, nevertheless, always the same process,—a mattery softening of the papillary body, with the prickle layer upon the one side and an apparently inadequate adhesive-ness of the overlying horny layer upon the other. The formation of pus, under the influence of the reducing remedies, has one advantage over each ordinary suppuration process,—the new cornification, which always originates in the residue of the epithelium remaining, takes place more rapidly and decidedly than anywhere else, and the resulting scars are therefore flatter, smoother, and more symmetrical than usual. That this universal termination is due to the continual influence of the oxygen withdrawal is, indeed, more than probable; as regards the formation of pustules, large doses act contrary to weak ones. The horny covering present on the pustules is thrown off, and a new one is not supplied again. Therefore the rule holds, for the therapy of all processes accompanied with pustulation (acne, boils, etc.), that from the very beginning a strong reducing effect must be introduced.

A further effect of strong doses of the reducing agent which is unnoticeable, or only slightly so, with the weaker action, is a considerable softening of the collagenous framework of the cutis. This is possibly explainable through the lesions of the vascular system and the overflowing of the tissue juices. Yet it is always noticeable that the softening is of a much higher degree than in ordinary inflammations, and further, that tissues specially free from vascularity, such as scars and keloid, undergo a marked softening under this treatment. It is therefore probable that strong doses have a direct collagen softening influence, which would equalize the deleterious action on endothelium and epithelium. At all events, in the treatment of the hardened tissues of old eczemas, of scleroderma, and ele-

phantiasis, but particularly of the scars of small-pox and acne and all keloids, these remedies find an extended use. The nerves likewise are effected by large doses of the reducing remedy in opposite ways than by small ones. There appears at first a slight feeling of pain, which, by the further use of the agent, decidedly increases, while the feeling of itching, which appeared in the beginning, passes away. After the falling off of the horny layer, quite a severe pain, like that of a wound, sets in, as well if the denuded places remain free as when they are exposed to the continuous strong action of the medicament. This pain is only permanently quieted by covering with the same agent in weaker doses. Where, although strong doses have been used, liquefaction and pustulation do not appear, as is often the case in the use of chrysarobin, then most intense itching persists, just as when weak doses are used. We have consequently to note an entire series of constant symptoms as the effect of the reducing agent upon the sound skin, which, with weak and strong doses, bear a character partly alike and partly opposed to each other. For a better review they are tabulated as follows:

	WEAK DOSES PRODUCE:	STRONG DOSES PRODUCE:
In each dose alike.	1. More marked cornification.	1. More marked cornification.
	2. Dark color of horny layer.	2. Dark color of horny layer.
According as the doses vary.	3. Itching.	3. Generally pain; seldom itching.
	4. Removal of inflammation.	4. Inflammation.
	5. Removal of œdema.	5. CEdema.
	6. Pustulation.	6. Removal of pustules and boils.
	7. Alleviation of pain.	7. Painfulness.
Only observable with strong doses.		8. Formation of blisters.
		9. Softening of the collagenous framework.

A much more difficult question for examination faces us in the action of the remedies in question upon the exposed cutis, since, as manifold as its lesions are, so manifold are the appearances arising from the action of each remedy. The ultimate effect in this case is determined more by the parts of the cutis which the remedies directly act upon than by the weak or strong dosing. The normal skin offers the most favorable

opportunities if the lesion presents a simple break in continuity, as, for example, a smooth cut. In this case, applying a pure ichthyol salt or resorcin in strong doses causes an instantaneous contraction and scarless union which really represents the ideal healing of these kinds of wounds.

The same remedies will also act very favorably upon an extensive burn of the first degree, and likewise upon one of the second, as long as the blisters are small and unbroken; on the other hand, if they are applied to such a burn, whose surface, after the removal of the horny layer, is covered with swollen prickle-cells, or to extensive erosions or sensitive regions of the skin,—*e.g.*, the glans penis or foreskin,—then the result is catarrhal inflammation of high grade, an acute dermatitis with œdema, and great pain. Whereas, if the same remedies are injected into a cavity of the cutis, which is lined with poorly-nourished pavement endothelium; into the subcutaneous tissue; into the suppurating periglandular connective tissues of an infected gland; into a fistula or serous cavity, as the tunica vaginalis; a primary, rapid union, with absence of all inflammation, provided other conditions are favorable, can likewise be obtained. Thus we see that it depends chiefly upon the “reaction ability” of the respective tissue directly affected, whether we reach the wished-for result of drying up, contraction, and primary union, or whether we call forth an undesirable inflammation. The *rôle*, therefore, which these remedies have eventually to play in the technique (which is so widely extended to-day) of wound healing is one specially peculiar to themselves. On the one side, they are too widely removed from them to be able to compete with the principal antiseptics—carbolic acid, iodoform, and sublimate—in the certainty of the antiseptic effect, universal application, and cleanliness. Yet, upon the other side, they are able, rightly used, to accomplish far more than these, where rapid primary shrinking, absence of reactive tissue-growth, and a scar without defect is at stake, and they are worthy, in this regard, of every consideration from the surgeon. In general the rule holds good that the poorer in blood-vessels, the freer from nerves, and the dryer a portion of tissue is, by so much the better does it bear, without

harmful reaction, large doses of the reducing agents; while tissues rich in cells, protoplasm, and vascularity are at first to be cautiously subjected to the action of a weak reduction. If the wished-for drying has been brought about, we may here proceed to the use of stronger doses without danger. Most of the lesions of the skin encountered by the dermatologist are not clean wounds,—*e.g.*, breaks in the continuity of the connective tissue, such as are generally met by the surgeon,—but a wounded surface made up of different tissues. For example, in a lupus which has been scraped out we have, in the vicinity of clean excavations in the cutis, islands of old epidermis and innumerable half scraped off stumps of epithelial formation deeply wedged into the skin, together with hairs and convoluted glands. In an old ulcer of the foot we have to do with the same variegated picture of offshoots from the outer and middle germinal layers. An eczema madidans certainly presents a layer of tissue of one kind; epidermis alone is seen everywhere, but in the most different forms of, as yet, intact horny layer and the youngest prickly layer, so that, in this case also, the influence of the reducing agent must be quite different. Here, in fact, the remedies act in a selective way on the tissues in the sense just described.

If the remedy and dose have been rightly chosen, there follows at once a contraction of the producing elements of the skin and an over-balancing of its rigid or stiff supporting elements. The tendency to cornification and healing governs. Certainly the same pyrogallic ointment, which gradually produces healing in a scraped-out lupus, would prolong, *ad infinitum*, each weeping eczema,—indeed, would, in the highest degree, change it for the worse; but a weak ichthyol salve would in this case have an entirely analogous effect for its result to the pyrogallic salve in lupus. This selective tendency, not dependent on the germinative membrane, but on the greater or less life-energy of the elements of the skin, be they normal or pathological, is the characteristic merit which the reducing remedies exhibit over all others and which secures for them a prominent place in the treatment of such dermatological lesions.

I must, in this place, call to mind a specific peculiarity of these reducing agencies,—that is, their styptic effect. The means and ways for stopping local bleeding are, as is well known, different. They may be divided into four chief categories. Either we produce an artificial clot, which, adhering firmly to the vessel wall, closes its orifice,—as, for example, by means of the actual cautery, of the so-called wound-sponges,—or we form a plug out of the blood itself, through clots produced by means of chloride of iron, lunar caustic, or acids, thus closing the bleeding vessel. The real astringents—tannin, alum, and the lead salts—act somewhat differently, as with these the narrowing of the vessels is due to a specific contracting influence exerted upon the vessel itself. The latter is seen, in its purest form, in the fourth method of stopping hemorrhage,—that is, the application of cold by means of ice or ether spray. The reducing agents follow, as regards the method of their styptic action, the third category, and especially tannin. The withdrawal of oxygen has the effect of contracting the vessels. This does not appear suddenly, but slowly and surely, and is long continued. Moreover, the blood becomes changed into a brown, greasy, sticky mass, which truly forms no solid coagulum, but, together with the mechanical absorbing effect of some common surgeon's cotton, is sufficient to restrain the flowing blood and produce a clot which rapidly becomes hard. It is just in this way—of all the antihemorrhagics—most like tannin. The dose of the reducing agent used for this purpose must be a maximum one, since the flowing blood continually partially neutralizes a quantity of the medicament applied. It is therefore advantageous, as is generally the case with all weaker antihemorrhagics, to paralyze the thinning influence of the flowing blood by the simultaneous use of absorbing agents, which partly lessen the bleeding and partly take up the blood gushing out so freely, so that the antihemorrhagic may accomplish all of which it is capable. We therefore soak the mull, cotton, sponges, etc., in the concentrated ichthyol preparations, pyrogallol, etc., and keep these dried dressings on hand. These have this great advantage over the stronger, caustic-like remedies,—such as chloride of iron, which often acts in an un-

desirable way,—that the tissues do not suffer the least under their use.

The influence of these remedies upon hemorrhage from different organs, when exhibited internally, is not unworthy of notice; pyrogallol given internally in doses of .05 every three hours or every half-hour, according to the severity and danger of the hemorrhage (best in alcoholic solution), I consider a medicament not entirely free from danger, but, on the other hand, one of our best, because universally useful and a sure acting antihemorrhagic.

In emergencies (hemorrhage from the lungs, from the middle vessels, bleeding from the intestinal canal) I would not hesitate to give pyrogallol in much larger doses, rapidly repeating them till symptoms of intoxication are caused,—*e.g.*, black urine, nausea, dizziness, vomiting, thready pulse,—and then stop the further action upon the blood with larger doses of muriatic or sulphuric acid. The supplementary treatment with mineral acids removes the deleterious reducing effect upon the blood, while it maintains independently, in a low degree, the antihemorrhagic effect.

I now come, after considering the action of the reducing remedies upon the unbroken integument and upon the exposed cutis, to the discussion of their antiparasitic effect. The deserving and learned dermatologist, Ernest Besnier, in a recent critical review of an article from the pen of Doctor Cramoisy (Paris),* which he presented to the Academy of Medicine, has incidentally given expression to his conviction that the so-called antiparasitics produce their effects not so much by destroying the parasites of the skin, as by necrosis of the superficial dermal epithelium, and only in the degree that these remedies produce exfoliation of the epidermis can they be serviceable for the cure of the parasitic dermatoses. Besnier rightly opposes the current view which regards the action of the antiparasitic therapy simply as a killing of the parasite by means of the remedy, in whatever way it is used. He calls it a legend which, resting on inexact observations and naive explanations of experiments, is propagated without correction among physicians. His own words are worth noting:

* *Traitement des Teignes.*

“ En cette matière ce qui, même aujourd'hui, détourne encore de très bons esprits de la voie véritable, c'est de vouloir assimiler les actes chimiques de la vie organique aux réactions obtenues dans le laboratoire et la cellule vivante, envahie par le parasite, à ce parasite isolé sur le porte-objet pour les études micro-chimiques, ou traité dans les milieux artificiels. Ce que beaucoup de chercheurs, même parmi les médecins, semblent oublier, c'est que l'élément organique vivant doit rester l'objectif immédiat de toutes les actions médicamenteuses, et cela sans aucune exception, qu'il s'agisse des dermatomykoses, de la septicémie chirurgicale, du choléra, de la fièvre typhoïde, de la tuberculose, ou de toute autre affection de même ordre. Dans tous ces cas, la recherche d'une action purement chimique est le rêve; la réalité réside dans l'action médicale proprement dite, c'est à dire dans les opérations vitales provoquées par le médecin.”

With this fundamental view of Besnier we state that we completely agree; on the contrary, we cannot favor the positive, one-sided, and too far-reaching view that the direct destruction of the parasite is a result never attained, and indeed unattainable. The one example which he adduces—the treatment of pityriasis versicolor by means of a quicksilver preparation—proves nothing for the universal question.

Certainly it is true, even with such a simple parasitic disease, that a dose of the medicament which is too weak is without healing influence, while one that is too strong produces desquamation; and this gives ground for the belief that the healing is effected by the desquamation. But does this prove that the healing, resulting from the use of just the proper dose, is effected *only* by the desquamation, and not by the direct antiparasitic action also?

For this purpose, first of all, the proof would be necessary that we effect a cure, in this most innocent and superficial of all the parasitic affections of the skin, by mechanical means only,—*e.g.*, by friction with sand. But, by this mechanical method only, pityriasis versicolor is just as incurable as by the use of insufficient doses of chemically-efficient remedies. Certainly Besnier states that we can cure with pumice-stone

rubblings, but, for this purpose he mixes it with soap ("Un savon anodin mélangé de pierre-ponce," page 6), which materially injures the purity of this counterproof. But let us suppose that we are able to prove that pityriasis versicolor, this most superficial of all the diseases of the horny layer, can be healed by very thorough mechanical friction, which I doubt; still it would be far more difficult to bring forward the same proof for all similar diseases, affecting deeper tissues. Finally, each demonstration that some or all of the parasitic diseases of the skin can be mechanically removed would still be no proof that the chemical influences besides are not directly active on the parasites themselves, and that these influences are not always to be taken into consideration. Looked at in this way, the exclusive theory of the antiparasitic action of remedies—*i.e.*, as being a purely indirect one, brought about by the desquamation of the diseased cells—seems scarcely conclusive. But if we are not able to admit the theory of Besnier, propounded with so much genius and ingenuity, yet we must thank this investigator because he has brought forward a question of general importance and has sharply formulated the negative. Here, just as in many other respects, the skin is the most proper field for clearing up this question and bringing its solution nearer, since, in changes in internal organs, we are able only approximately and indirectly (by examination of the urea; weighing) to estimate the tissue elements which are absorbed; on the epidermis, in the desquamating horny layer, we see and observe these in every stage.

First of all, it seems to me an indisputable fact that the different antiparasitics—I mention, for example, carbolic and salicylic acid—materially differ from each other, just by the circumstance that they act upon the skin as such, and we could assert, without meeting the slightest contradiction, that those antiparasitics, *cæteris paribus*, act more strongly which excite a certain amount of desquamation which is kept within moderate limits. Salicylic acid acts more efficiently on the parasites of the skin than carbolic acid, which, through its volatility, is superior. It produces a permanent desquamation, which not only removes the destroyed parasites in the old horny layer of

the skin, but also brings the medicament nearer to the real seat of the parasites. I am certainly the last one who could fail to recognize this influence, since I first brought it forward* as a material advantage, especially of salicylic acid. I am, on the other side, firmly convinced that the idea of Besnier—which I could briefly oppose, as to the theory of the parasitifuge effect, to that of the parasiticide effect—is untenable from two directions.

On the one side there are cases in which the injurious action of the antiparasitic, which takes place upon the neighboring skin, although it leads to the partial elimination of the elements of the skin and of the parasites, yet directly aids the extension of the parasites, so that we can attain the most favorable results in the treatment of parasitic diseases only when we limit their injurious effects upon the skin. Thus, in lupus treated by punctures with iodine (by the dilatation of the neighboring vessels of the cutis produced by the treatment) we may prepare, on the periphery, new regions of the skin for the reception of the bacillus, although the parasites directly reached by the iodine are destroyed. Moreover, we see—the parasitic nature of psoriasis and of certain dry eczemas being admitted—that our best antiparasitics, chrysarobin and pyrogallol, call new eruptions into life, by their injurious influence on the skin (and this undesigned injurious action appears in those cases in particular where the remedy acts upon the cutaneous tissue in such a way as to produce inflammation and the formation of crusts), just where their antiparasitic power ought to be displayed in the highest degree.

Certainly, upon the other side, there are many cases in which we are so fortunate as to destroy the parasites in the skin with complete preservation of its texture. We perceive, then, that a desquamation maintained by parasites is brought to an end by our remedies, while the parasites themselves are destroyed. The reducing agencies now under consideration by us have just such an effect, but only, as a matter of course, if they are used in weak doses, or, at least, in doses of such strength that

* Eine besondere Eigenschaft der Salicylsäure.

the symptoms of irritation mentioned above do not appear. In this manner a sulphur or resorcin salve acts in measles and scarlet fever, making the skin paler, and, acting as an antidesquamative, combating the germ of the disease with its influence on the skin which excites to desquamation. A pyrogallol or chrysarobin salve acts in the same way in herpes tonsurans and psoriasis if the dose be rightly chosen and the undesirable symptoms of irritation be avoided. The crusts removed by this means contain only a part of the parasites,—those which have exhausted their vitality and thus probably were the most harmless, and those which were already dead. The proof of this is that, if in psoriasis we dissolve the crusts alone, by alkalies or salicylic acid, the underlying skin immediately produces scales again and does not appear more normal than formerly.

Presupposing the parasitic nature of pityriasis capitis, which results in alopecia and eczema, seborrhœa capitis, of which, I have no doubt, we observe also here the same appearances, under treatment with sulphur or resorcin,—viz, the scales already present fall off, dry to brown crusts, and leave behind a smooth, soft skin containing the normal amount of blood which no longer scales, and occasionally is healed by a few applications only. We certainly have, in all these cases, a specific influence upon the real germ of the disease, and yet, at the same time, an action opposed to inflammation and non-injurious to the skin itself, and which prevents the desquamation and thus the outward elimination of the disease-germs.

We have, in other words, treated both cause and symptoms of the disease,—*i.e.*, antiparasitically and antidesquamatively. Moreover, is it possible for us to represent this causal therapy, from its nature, in any other way than that the reducing agents, according to a view already advanced by me, dispute the oxygen with the partly demonstrated and partly assumed parasites and destroy them by a withdrawal of a requisite for their existence? At all events, I believe this is the view that is gaining ground in the profession.

That, by proper use, the same remedies remove at the same time the symptoms of desquamation,—*i.e.*, hinder the formation

of new scales,—lies, as I have shown, in the nature of the same oxygen-withdrawal. Observation of the influence of the reducing agents on the skin shows us, in an unmistakable way, that our therapy actually does more, in fact, than to eliminate the parasites merely by exciting rapid desquamation. That would be, as it were, the death sentence to every internal parasiticide therapy; and yet it is very improbable that, with reasons of like probability, Besnier's theory of the parasitifuge therapy can be advanced for internal organs. For nowhere else on the body can we bring about exfoliation of decided masses of cells in like manner as in the skin by desquamative process. If, therefore, parasites on the skin could be rendered inactive, really, only in this indirect way, it would be a very sad prognostic for our internal antiparasitic therapy, and it would be scarcely possible to explain how by means of quinine we can, almost at pleasure, influence the malarial germ, and by means of iodine and mercury affect the liver and bones suffering with syphilis.

No; we possess, in fact, speaking very generally, two ways through which we are able to reach, and always have reached, the parasites within the human tissues. The one makes use of parasitifuges and alteratives. In this case we attack only the fostering soil of the parasite, the tissue itself, and cause it either to necrose so that it is eliminated with the parasites (desquamation on the external skin, interstitial absorption and digestion of necrotic cells in internal organs, catarrhal, croupous, and diphtheritic elimination on mucous membranes); or, *vice versa*, we bring about a higher activity (alteratives), so that it is able successfully to withstand the parasites (cure of herpes tonsurans by the artificial production of kerion; of a parasitic eczema by blister-plaster, or scarification; of phthisis by gymnastics of the lungs). We pursue the other way (of directly destroying the parasite) with success, as indeed has been already done for a long time by means of the, in a narrow sense, so-called specifics, such as quinine, mercury, iodine, salicylic acid, and arsenic. These can be arranged as equals of the reducing remedies, only that here the action upon the external integument is much more manifest, simple, and com-

prehensible. They indicate the way by which we can effectually attack parasites in internal organs.

Let me cite one example only; we have recently actually succeeded, in this way, in curing the same disease of internal organs—which had extended from the skin to these organs—by means of a form of direct parasiticide which had been tested on the skin itself. The disease to which I refer is leprosy. I hold, therefore, that the conception of Besnier, so cleverly and energetically defended, is only half the truth. We possess, of course, the best remedies and the best combination of remedies against parasitic diseases when they are, at the same time, directly and indirectly effective. We shall therefore, very properly, combine with those reducing substances which act directly others which act indirectly, as parasitifuges to a high degree,—*e.g.*, salicylic acid,—thus obtaining a much stronger influence over the parasitic germs of the skin. If the general indications of the reducing group which have been thus far discussed hold good, more or less, for all of the individual members alike, yet it is of course true that each substance, taken by itself, possesses its well-defined therapeutic field, and these fields coincide to a limited degree only; they are, for the greater part, separate. As I have said, in combination with the reducing quality common to all, certain positive qualities appear for each single one, which are alone due to their chemical actions, and moreover all possess different physical characters, different forms of most suitable application, and these are called forth by very different concentrations, where otherwise their qualities and indications are completely concealed. A comprehensive picture of the range of action of this group is obtained, therefore, only by a description of the single indications of each individual remedy, and of a comparison of the same directly thereafter. Such a description would far exceed the limits of a single article. I confine myself therefore, in the following pages, to the special discussion of some of the less-known remedies of this group,—that is, the ichthyol preparations and resorcin. I take it for granted that the indication of the other chief representatives of the group—sulphur, pyrogallol, and chrysarobin—are more or less known.

The representation of the group *in toto* I reserve to a time in which these less-known remedies shall have become more generally known to the profession at large.

Ichthyol, by which name I shall designate, for brevity, the ammonio-sulphate of ichthyol, has its most extended use in all forms of rosacea. It exactly fills a long-standing gap in our stock of remedies, and, in its manifold capacity for use in this complaint, is as yet unequalled by any other remedy. It is of value here, as a matter of course, through its contracting influence on the vessels, and we must therefore, in all severe cases, make the most extended use of the drug, combining the internal with the external administration. Very often we find rosacea complicated with other anomalies in the circulation, as with diffuse erythema of the mucous membrane of the throat, appearances of engorgement of the hands and feet, such as chilblains fully formed, piles, different anomalies of menstruation, passive hyperæmias of the venous plexuses of the pelvis and vertebral canal, etc., all of which are traceable to a want of muscular tone in the blood-vessels of the different regions. A noticeable improvement of these allied troubles almost always occurs under the continuous use of ichthyol internally.

The strength of the external ichthyol treatment is governed, very decidedly, by the condition of the epidermis and the more or less irritable or indolent condition of the vessels. We can, at least, from a practical point of view, distinguish two forms of rosacea, the first of which tends towards common eczema and erythema, the second towards acne. The first form presents generally a bright-red arterial congestion of very variable intensity depending on the irritants acting upon it, among which changes of temperature play the most important rôle.

The thin epidermis is either smooth or slightly scaly, exfoliating in thin lamellæ, and almost always destitute of comedones and acne papules. More powerful irritants—as, for example, medicaments which do not agree—very easily produce eczema, and the little pustules which spring up spontaneously now and then are small and superficial, and resemble perfectly eczematous vesicles which have become pustules.

The other, as far as I see it, more usual form presents, typi-

cally stamped, the picture of a hard knobby acne on a dusky, bluish-red, swollen background. The epidermis is thick and raised in irregular lumps. The nodes and pustules with which the surface under these circumstances is covered are distinguished from those of acne by their greater hardness and permanence and the smallness of the quantity of pus contained in the pustules, which, moreover, do not invariably contain comedones, as is the case with acne. The redness is venous and has much greater persistence against external irritation. The skin in this case is not at all inclined to eczema,—as little, indeed, as it is in the other case to acne. It is clear from the above analysis that ichthyol can only be given in the latter form with a free hand. In these cases, used in strong doses, it will display just the right effect, since the action is accomplished only slowly through the thick epidermis. The swollen veins and venous capillaries gradually return to the normal calibre, the thick epidermis becomes thin, the pustules pass away, and finally the tendency of the skin to fibrous formation is resisted. In those forms which approach eczemas the same dose would injure the defective epidermis and in the end itself call forth an eczema; at all events, the overcongestion would only be augmented by reflex action, so that the real direct vessel-contracting influence cannot occur. We must therefore in such cases employ salves of a very weak per cent. or, better yet, pastes and varnishes, or altogether give up the external use of ichthyol. These are, then, the cases which are healed alone by the internal use of ichthyol and washing with hot water and ichthyol soap.

One or two cases from my practice will illustrate what has been said. I have chosen for this purpose those cases in which other medicines were not used, and give as the first an extremely severe case of the torpid acne-like form of rosacea.

No. 1.—Miss B., aged thirty-nine years, suffered in her childhood with a pimply eruption (acne); later in life redness of the face was associated with this, which increased from year to year. Patient is weak, slenderly built, anæmic, and nervous in the highest degree; muscular trembling with almost all movements, especially of the lips in speaking. The exanthem on

the face has never been treated, being regarded as incurable. The entire face, with the exception of the vicinage nearest the eyes and the mouth, is covered with small, hard, and partly pustular papules, which rest on a skin diffusely cyanotic, somewhat thickened, and decidedly hardened and pigmented in spots. The skin of the rest of the body normal. No anomalies save great weakness of digestion.

July 11, 1885.—The pustular vesicles were opened by gentle scraping with the sharp spoon. Internally five drops of ichthyol morning and evening. At night a ten per cent. ichthyol paste, washing with hot water and ichthyol soap, gentle scraping of the papules which had become pustular was frequently employed, until the end of the month. This was necessary less frequently in the following months. The use of the sharp curette as in acne was avoided. Meantime, the internal and external ichthyol treatment was continued without interruption.

November 15, 1885.—The skin of the face is free from its redness, pigmentation, and thickening; moreover, the anæmic and nervous condition of the patient is decidedly improved, the appetite has returned, the muscular trembling has passed away, and the apathetic condition has ceased. The patient herself, now for the first time, believes that she will be cured, and complains only of pain in the back on walking. The same treatment was continued, only the use of chloride of iron pills was now combined with the internal administration of ichthyol. In December, 1885, and January, 1886, the patient, totally changed in appearance, once more presented herself. She was advised still to continue the ichthyol internally for an indefinite time.

Two cases will serve to explain the action of ichthyol in those cases of active rosacea with a tendency to eczema.

No. 2.—Mrs. B., forty-two years old, has had a redness of the skin of the entire face for several years, which shows, besides, a tendency to brittleness and desquamation in a slight degree; only occasionally isolated acne pimples. The redness changes greatly with the prevailing temperature, is of an arterial color, diffuse, without any special prominence of single vascular branches.

February 8, 1885.—Five drops of ichthyol internally morning and evening. During the day only cold cream to be used and bathing with hot water and ichthyol soap.

February 15.—Redness decidedly diminished. The foam of the soap is not to be washed away but wiped away dry, for the sake of attaining a stronger effect.

February 22.—Improvement continues; cold cream is omitted as no longer needed.

March 1.—Skin of the face almost normal in color. During the treatment some acne pustules appeared which rapidly disappeared again.

March 8.—Skin normal. Rosacea healed. Ichthyol internally continued.

No. 3.—Mrs. S., thirty-six years old, has suffered from a constantly-increasing redness of the cheeks and nose. She is her own cook, and finds that the heat radiating from the stove makes the trouble steadily worse. The heat is also painful. Otherwise no anomalies. The redness was like a smooth, polished, red varnish; no nodes or pustules; color bright, arterial; some large vascular branches visible.

April 24.—Ordered bathing with hot water and ichthyol soap several times daily, especially after cooking. At night, and as often as possible by day, the parts to be painted with a paste of ichthyol and dextrine (4 to 20).

May 4.—Marked improvement in spite of continued work before the stove. Patient states that she does not find the radiating heat painful if, a short time before exposing herself to it, she paints her face with the paste. She presented herself again on June 6, completely healed, and was advised from this time forward to take the ichthyol internally, and to use hot water in order to make the result obtained sure. The paste was omitted.

What I have just said about the action of ichthyol in the acne-like form of rosacea holds good, as a matter of course, in just as high degree for acne itself, only here the case is practically different than with rosacea, because we have always had far more and better remedies against acne, with which ichthyol must now come into competition. The chief external remedy

up to the present time was sulphur, which has the advantage of ichthyol in freedom from odor. But there are cases in which sulphur cannot replace ichthyol. First of all, sulphur so irritates the eyes of some patients that its use in every form must be suspended. These patients awake in the morning—without the sulphur salve or paste having come directly into the eyes—with dull pain in both eyes. The conjunctivæ are red and a more copious secretion of tears than usual takes place. These conditions, without being dangerous, interfere with seeing and make the patient anxious. No idiosyncrasy of such a nature exists with ichthyol. Moreover, we often wish to use, in connection with the sulphur cure, a lead or mercurial preparation, and we are then put in an unpleasant position, since, by this means, we call forth a transient discoloration due to the separation of a dark sulphide. This contra-indication also does not exist with ichthyol.

The second chief remedy in acne, corrosive sublimate, agrees specially well with ichthyol (better than sulphur), and I am accustomed to begin the treatment of bad acne cases from the very outset with both remedies, using ichthyol at night and sublimate by day. Moreover, the mechanical treatment, so necessary in acne, can be combined excellently with the pencilling of the parts with ichthyol in the evening. Moreover, this follows up or supplements frictions with sand or marble soap, and is heightened in its effect by the latter.

So ichthyol turns out to be the internal remedy *par excellence*—thus far discovered—against acne. Sulphur, in the form of gelatine-coated sulphide of calcium pills, is really only effectual in the pustular form of acne; arsenic helps in some cases only, but just what class of cases is not fully determined. Moreover, arsenic is a remedy which no physician could recommend for continuous use in such a trifling disease as acne.

On the other hand, ichthyol taken internally is useful in all forms of acne, the pustular as well as the papular. Moreover, when the patient has become used to it, it can be taken continuously without injury and without a contraindication. Under its consistent use many other complaints heal,—for example,

among other things, the severest kind of gastro-intestinal catarrh. It is also the best supporting measure which we could combine with any external treatment of acne. To make a selection from the great number of acne patients whom I have treated with ichthyol during the last three years, I should consider as difficult as it would be unnecessary. As an example, let me be permitted to select one case of acne of the chin from among the severer cases treated only with ichthyol, because I have learned to recognize the isolated acne of this region as always the most stubborn of all forms of the disease.

No. 4.—Miss S., forty years old, consulted me in the middle of October, 1884, for an acne indurata, which had troubled her for a year. Otherwise wholly well; no digestive disturbances; menstruation for some time back irregular. The acne occupied solely the region of the chin. Both sides beneath the angles of the mouth were the seat of hard, pea-sized papules of a dark red color having in the centre small accumulations of pus. The entire region hyperæmic; swollen but not painful. They were also present on the centre of the chin, only more disseminated. These papules, more fibromatous than pustular, came and went very slowly, and in the place of one which had passed away, other new ones steadily appeared, though always confined to the same region. The forehead and cheeks showed neither acne nor rosacea. I prescribed internally 15 drops of ichthyol, 10.00; aq. destill., 20.00, morning and night, in a wineglass of water, and externally a ten-per-cent. ichthyol lotion, which, at night, was to be pencilled upon the chin. During the day the external treatment consisted only in the use of hot water and of ichthyol soap, containing a super-amount of fat (*überfettete*).

No marked change appeared in the first week; in the second, a noticeable paling of the entire chin set in, the skin by day looking somewhat yellowish in color. Still, however, new tubercles were making their appearance. In the course of November, we could see each week a visible and progressive improvement. On the 5th of December the chin was, for the first time in a year and a quarter, smooth, and, moreover, normally colored again; no regulation of diet had taken place. I

had not undertaken scraping or puncturing, which in these fibromatous nodules is of little service. As an after cure I ordered only 1 ammon. sulph. ichthyol, to be taken daily in pill form, and continued for some months. In the course of the following year I had frequent opportunities of proving the permanence of the cure.

Among eczemas we distinguish, from an ætiological standpoint, two chief groups. The one comprises those kinds of eczemas which are brought on by nerve lesions; the other, such as are caused by parasites. We can, fortunately, despite the defectiveness of ætiological studies up to the present time, hold to these divisions in eczema quite strictly, which, for prognosis and therapy alike, is important. Just as many physicians decided on the specific and parasitic nature of tuberculosis from clinical observations, long before this was actually proven, so can we be permitted to draw ætiological conclusions from all the clinical conditions of the different diseases of the skin (without in the least anticipating future research) which will, at least, come very near the truth, and, until a definite decision is reached, will lead us to a more successful treatment in practice than the assertions of most text-books, which, up to the present time, are not only very vague, but also, for the most part, alike disputed and unproved. Among the eczemas which very probably are referable to nerve lesions, I place that in particular called by me "*Nervöse Exzem.*" The sufferers from this form of eczema are not, absolutely, very healthy persons. It attacks generally adults, at the least not very young people, much more frequently elderly individuals. The eczema appears in very characteristic crops, similar to zoster, always multiple, and with a marked tendency to exact symmetry. The form of the disease is the vesicular one, and the eczematous vesicles are seldom so beautifully formed, so tense and lasting as here. The groups form, as in zoster, umbellar plates, very elevated and hardish. They are differentiated from the groups of vesicles of zoster by the want of inflammation in their immediate neighborhood, their slower formation, the intense itching, and the want of real pain,—differences, all of which are explainable by their chronic course as compared with that of zoster vesicles.

On the other hand, again, they approach this latter disease decidedly, in this regard, that they follow unmistakably the course of the greater cutaneous nerve-trunks without filling up the region supplied by them in a diffuse manner. They show special preference for the region of the radial nerve, and we often find patients who present small patches of eczema arranged very symmetrically solely on both hands on the radial side. Between these widely separated groups the skin is perfectly normal, the horny layer firm, and not exfoliating; sometimes all four extremities are occupied in a noticeably symmetrical manner with scanty groups. After the extremities, the face is next most frequently attacked. In the neighborhood of the mouth and nose are isolated eczematous groups of the kind which, taken by themselves, are scarcely to be distinguished from herpes labialis. Nervous eczema seldom occurs on the trunk, and, when it does, occupies generally the median line. The relation to the different forms of herpes would be ætiologically defined in this manner, that the nervous eczemas have similar but more permanent causes, which must present a central seat, because the disease of the skin caused by it does not appear unilaterally but is always symmetrical.

These symmetrical neurotic eczemas are to be differentiated from the parasitic affections, also so often symmetrical—as eczema parasiticum, psoriasis, lupus, syphilis—by this, that the portions of the skin which are attacked neither correspond very exactly in a rough anatomical way nor show positive histological distinctions (as joints, elbows, flat of the hand, etc.), but only lie in exact symmetry in so far as they follow the symmetrical course of nerve trunks at very equal intervals, the places corresponding, to a certain extent, to the giving off of the nerve filaments to the skin. This eczema, which could be called the herpetic form (*eczema herpeticum*), shows an unusual tendency to relapses. I believe that the experience of the French, English, and Americans,—which is not to be despised,—that certain forms of eczema cannot be permanently cured by local treatment alone, refers chiefly to this form. Here, in fact, exist, as already remarked, general disturbances of health, or special disturbances of organs, such as gastro-intestinal catarrh,

concretion formations in urinary or biliary passages, excessive formation of uric acid, oxaluria, etc., and almost always a pronounced anæmia of the skin and mucous membranes. On the other hand, there are the single outbreaks, occurring at long intervals, often apparently due to, or called out by, mental overstrain, care, grief, night-watching, etc. We should therefore in these cases, during the removal of the particular eczematous attack, and still more in the intervals of health between the outbreaks, remove—if possible—these constitutional anomalies as best we may.

For this purpose medicinal springs are useful; also the internal use of arsenic, which acts directly on the central nervous system, and has sometimes a remarkably favorable influence on the skin; sea-bathing and rubbing with sea salt have also proved beneficial, while the use of iron alone, only occasionally, promises results. Here now is also a favorable field for the internal and external use of ichthyol. I have seen several severe cases of nervous eczema permanently pass away, while the entire constitution improved, under the long-continued use of ichthyol, which had been treated in the usual manner with zinc, lead, and tar salves, and which regularly disappeared, and returned again with equal regularity after a short time.

Ichthyol can be used externally in much stronger concentration in these cases of eczema than in those produced by parasites and by noxious influences encountered in pursuing certain avocations, because here the vesicle formation takes place on an otherwise healthy epidermis which has not been injured and thinned by external causes. On account of the anæmia of the skin, present in most cases, the horny layer is generally specially firm and fast. There, therefore, in the very beginning, it is specially advantageous to pencil the ichthyol, as little weakened as possible, on the groups of vesicles before they have been scratched, in order to cause them to dry up rapidly. This holds good especially for the extremities; in the face the same effect can be reached with thin (ten-per-cent.) watery solutions. But this momentary favorable effect produced by a purely local treatment is also instructive. If we still continue the use of ichthyol on the same place, already

dry, and in the same strength, with the idea of preventing the return of the vesicles, a new eruption almost certainly appears after a time; while we can apply without bad results solutions which are gradually reduced. It is therefore of practical value to use the ichthyol externally only periodically, restricting it to newly-appearing groups of vesicles, and instead continue its systematic internal exhibition. From what has been said, it follows that, under certain circumstances, it would be advantageous to preface some other eczema treatment—as tar treatment, a course of sulphur baths, an arsenic cure, etc.—with the use of ichthyol, in view of its very rapid drying effect, as preparatory.

No. 5.—A. D., fifty-nine years old; as a girl was, generally speaking, healthy; married in 1850, and has had eleven children, of whom seven are living. In her first pregnancy an eczema appeared, which passed away after confinement. Ten years ago she had ischias, which was rapidly cured. Menses ceased in 1880. Since then she has suffered with gravel, enlargement of the liver, and gall-stones, the passage of which took place with violent symptoms, and was repeated again in 1882. On this account she visited Carlsbad, in 1882 and 1883, with good results. Tendency to obstructio alvi is always present. I treated the patient repeatedly since 1878 for universal attacks of eczema, which showed throughout the nervous characteristics. They were specially obstinate and almost always never disappeared. The hands and arms were attacked with symmetrical umbellar groups of vesicles. In the intervals during which the skin was free from disease it was always very anæmic, yellow, and decidedly pigmented.

In May, 1885, taking advantage of a new universal eczematous outbreak, I ordered, for the first time, ichthyol internally and externally. This was well borne, and relieved the itching remarkably. It was used principally on the face as a thin watery solution. On the extremities it was necessary to supplement the cure by the oft-repeated use of salicylic plaster mull. By the middle of June the patient had entirely recovered, and continued by my advice the ichthyol internally. I saw her again in August, vastly improved. Numerous gall-stones were

passed without pain; the liver was reduced in size, as after a course at Carlsbad; the color of the face was fresher and clearer than for years. The appetite was excellent. Now and again slight itching occurred; eczema vesicles appeared seldom and few in number, and were easily removed by pencilling with a watery solution of ichthyol. A course at Carlsbad was not necessary this year. The patient took the ichthyol through the entire winter, without the usual appearance of a severe eczematous attack, and was, at a recent examination, much better than at any time before in the preceding six years.

To the nervous eczemas belong those occurring periodically, by preference in young people and children, and combined with asthma. There does not exist, by any means, in these cases,—as most of the laity and many physicians, basing the statement on inexact observations, assume,—a direct alternation of the skin and lung symptoms. This prejudice is a false conclusion based on the false premise of the transfer of the skin disease to the internal organ and from it to the skin again. In such cases, in which the long periods of freedom facilitate the observation of the invasion of the disease, we see, generally, that both affections appear at the same time, or, speaking more exactly, one precedes the other by a short period without any regularity existing in their succession. If we have the parents of such children note exactly, in writing, the occurrence of the attacks, they themselves very soon come to the same conclusion,—that both affections are traceable to a common origin, that they intensify each other in their injurious effect, and in no way neutralize each other; then they are inclined to allow the skin-disease to be removed, because they no longer expect from it a beneficent effect on the lung-trouble. Ichthyol, which I am accustomed to prescribe internally only in these cases, just to corroborate the connection of both affections, acts equally well on both. Children, who are generally the patients in question, usually take it readily, and must continue it, year in and year out, in small doses, of five to ten drops daily, in a little wine or beer. The attacks diminish directly in frequency and severity, the remissions become longer, and gradually the affection loses completely its severe character, while

the entire nutritive state is improved. It is true that slight relapses appear now and then, especially in winter during bad weather, but these are usually relieved in one or two days if the doses of ichthyol are increased four or five times over the usual amount. If the eczema has reached a greater intensity, pencilling the parts with a weak watery solution of ichthyol or, better yet, the use of the zinc ichthyol leim is sufficient as an external adjuvant. Prior to this we were compelled to resort to a long-continued internal administration of potass. iodid. and an external treatment with sulphur and tar, right tedious to carry out. I believe therefore that this new, extremely simple method of treatment deserves a favorable reception.

No. 6.—A boy, three and a half years old, has suffered, since six months of age, with nervous asthma, with which, in the second year, a nervous eczema was associated. Until the spring of 1885 both affections were under separate treatment, conducted partly by the family physician and partly by the specialist. In March, 1885, the treatment of both complaints was put in my hands by the family physician, as just then both had broken out again simultaneously. Iodine and cod-liver oil were now alike set aside, as well as the external application of the zinc ichthyol leim which had been used for a long time with good results as a palliative, and, instead of these things, five drops of ichthyol were given internally in beer, three times daily. The child very soon became accustomed to the changed taste of the beer. Under this treatment both affections disappeared during April, and on the 18th of April perfect health was established.

In the beginning of May a very much lighter relapse of the asthma appeared again, but without the return of the eczema. Now followed, for the first time, a long interval of undisturbed health, under the continuous use of the ichthyol, which lasted through the entire summer and autumn.

In November, 1885, during the very bad weather, an attack of asthma came on which lasted about a week. The eczema had disappeared and did not return. Meanwhile a noticeable improvement in the general health of the boy had taken place, —the color was fresher, the skin less swollen than formerly,

the appetite better; and the child, who, the year before, had to be carefully confined to the house summer and winter, had become, in the mean time, accustomed to the fresh air and did not suffer from exposure. The winter of 1885-86 passed away without, for the first time, bad relapses of both affections. The use of the ichthyol was constantly continued.

To these pure forms of eczema I add another affection, which, uncured, may finally develop into a severe form of eczema. I refer to the lichen urticatus of children.

A passage devoted to a discussion of these neuroses may be appropriately interposed. This affection (lichen urticatus) is looked upon in Vienna, in recent times, as the beginning of true prurigo, and passes, accordingly, for a rare affection. True prurigo is, in my sphere of observation in Hamburg, conversely, an extremely rare disease of the skin, occurring almost only among the poorest folk,—as is the case in England,—while lichen urticatus is a quite frequent disease of childhood, found also in well-to-do conditions of life. In spite of the material difference, I can establish the fact that lichen urticatus is often transmitted to the later years of life as a severe disease of the skin, but then this results in a very violently itching eczema, which certainly has a great similarity with the prurigo of Hebra, Sr. It shares with this disease the anæmia, the want of elasticity, the very persistent goose-like condition of the skin, the violent itching, the prodromal eczematous eruptions, the long duration, and difficulty of healing. It is differentiated from true prurigo by the lack of preference in respect to the exclusive participation of the exterior surfaces, and by the lack of those peculiar prurigo papules, concerning which the records are not yet fixed, since the younger Vienna school, year after year, define their nature in another way, and have not yet come to a thoroughly uniform conception.

All in all, I cannot avoid the conviction that, here as there, a pruriginous eczema gradually results from a simple neurosis, as the inflammatory appearances, which in the beginning were mild, become persistent. The difference appears after this unimportant, and easily explainable through the geographically different character of the most frequent cases, which must

therefore be looked upon as typical. It has been very interesting to me to have had the experience that this disease, unpleasant on account of its duration, also reacts very promptly to an internal exhibition of ichthyol. Moreover, in these cases I learned by experience that ichthyol produced a noticeable improvement if certain constitutional lacks and wants were recognized (as weakness, bad digestion, loss of appetite, restless sleep, abnormal thinness, anæmia of the skin, etc.), which were at the same time removed by the ichthyol.

No. 7.—L., a six-year-old girl, was kindly referred to me by Dr. Jarisch, of Vienna, on October 17, 1884. This child, who previously was perfectly healthy, had lost flesh decidedly from a disease of the skin which had appeared a few months before. Unceasing itching, restless nights, impaired digestion, and want of appetite sufficiently explained the woful appearance of the child, who had an "up-all-night" look. The entire body, with the exception of the scalp and the face, was covered with the wheals of lichen urticatus. The breast and back appeared specially attacked; on the parts near by was an extensive dermatitis caused by scratching. Insects, as the origin of the wheals, were entirely denied, and no trace of them could be proved.

On the 18th of October the treatment began, and consisted, first, in the painting of the entire body,—with special reference to the efflorescences,—morning and night, with ichthyol reduced with an equal part of water.

On the 22d of October a decided improvement of the condition of the skin could already be shown. The newly-appearing wheals healed more rapidly, and the old ones were disappearing together with the eczema.

On the 1st of November, the skin appeared completely clear, and in the latter days almost no more new papules came out. From this time forward, besides the external application, three drops of the same mixture were given internally morning and evening.

On the 8th of November the last of the itching disappeared; the nights are splendid; the appetite has returned again. The child is fresh, extravagantly lively, and scarcely recognizable.

From this time on five drops per dose were given. Solitary papules, appearing sporadically, were painted. As for the rest, the external treatment is suspended. During November I saw the child every eight days, afterwards every two weeks. The health continued, the child had more appetite than before her sickness, and the flesh increased accordingly. She had, moreover, as is the case with many children, such a passion for the taste of ichthyol that she took it of her own accord, the drops thrice daily instead of twice, until the spring, although the cure was long before perfect.

Since I here leave this form of nervous eczema, which we have been considering, I must hasten to remark that to one in practice these eczemas, just specified, do not always come under observation pure and simple; since an itching affection is always in question, and therefore we always have scratch effects, and, if the disease has lasted long, eczemas (due to scratching) on the skin which render the observation more difficult. The senior Hebra has, as is well known, always referred to the importance of scratching in setting up and extending an eczema, but has not given an exact explanation of this; at present we of course understand the process as a generalized vaccination of dermatophytic parasites by means of the finger-nails. With the nervous eczema, originally coming from within, is thus united a secondary parasitic one, and the tradition prevalent among the people of the "poisonous" nails is not wholly devoid of authority. The positive diagnosis of the form of eczema generally remains uncertain until the physician, after thorough removal of the eczema present, has an opportunity to observe clearly, during a relapse, the original form. With lichen urticatus we may include ordinary urticaria, erythema multiforme et nodosum, further the herpetic diseases, *e.g.*, zoster, *h. progenitalis* and *labialis*, and, last of all, a severe disease, very recently described by Duhring and also observed by me, *viz.*, dermatitis herpetiformis, which I unhesitatingly class among the dermatoses of neurotic origin. These are all suitable for the strong external treatment with ichthyol, because it is of importance, in them, to remove an œdematous or inflammatory swelling without our having—at

least in most cases—to take into consideration an injured epidermis. The chronic forms, among them *urticaria chronica* (*erythema nodosum*, *dermatitis herpetiformis*), are, moreover, specially well suited to an internal ichthyol treatment. The symptomatic urticarial wheal occurring about a flea-bite and *herpes labialis* afford the simplest examples. Here painting the parts once with one drop of ichthyol, as slightly reduced as possible, is sufficient to cause rapid drying and immediate cessation of itching.

The result, often surprising, in *erythema multiforme* appears more important. We must indeed understand that this complaint does not always take such a harmless and simple cycle throughout as is generally represented in the text-books. Cases occur which persist obstinately, though we may use the ordinary astringents, or merely powder and observe them. In such cases a single application with ichthyol cures now and again.

No. 8.—I treated in this way, in December, 1882, two cases of *erythema multiforme* at the same time, which occurred, as is worthy of notice, in two houses lying opposite to each other in the same street, which otherwise was but sparsely populated. The inhabitants of the houses, moreover, maintained no relations with one another. The one case in a child was confined to the region of the wrists of both hands. It healed after a two-days application of pure ichthyol. The other, a beautiful case of unilateral *erythema iris*, also situated on the wrists of a young man, was treated with compresses of lead-water and powder. The cure was protracted more than a week, and here also finally an ichthyol application made an end of the affection at once. Both affections were, moreover, interesting on account of the complication of an affection of the mucous membrane of the mouth, which, in the boy, appeared as a gyrate, whitish, irregular border drawn over the mucous membrane of the mouth, and in the adult, from the neighboring house, as scattered erosions. These likewise disappeared after the use of an ichthyol mouth wash.

Moreover, chronic and obstinate cases of *erythema multiforme* also occur which do not entirely heal under ichthyol. In such

a case I remove the disease by pyrogallol. In another instance such an erythema, after an unavailing treatment of pyrogallol, healed very easily and rapidly under the internal use of ichthyol. Against chronic nettle-rash we possess, in the salicylate of soda and in atropine, two such excellent remedies that, from a therapeutical view, we seem to be satisfactorily armed. But in this instance also cases occur in which both remedies and the entire array of nervines fail, and in just such cases ichthyol seems to step in with quite decided certainty as the special agent needed. I recall two such cases.

No. 9.—Miss S., twenty-two years old, choreic, entered my clinic in March, 1885, on account of a severe nettle-rash, which had existed for four weeks. After salicylate of soda, given in large doses for some days in succession, had proved valueless, a noticeable improvement was finally attained, in the course of two weeks, under the internal use of atropine thrice daily (in .0005 doses), and pencilling the wheals with equal parts of sprt. saponat. and tinct. belladon., and a great consumption of valerian tea and ferr. sesquichlor. pills, but the improvement was not permanent. Thereupon external applications of pure ichthyol were prescribed together with its internal use in five-drop doses three times daily, when the relapse not only healed rapidly but did not again appear after a continuous (merely internal) use of ichthyol for months at home.

No. 10.—Mr. S., of magnificent, strong constitution and in blooming health, consulted me during his stay in Hamburg, on the 18th of June, 1885, for a nettle-rash which had appeared some weeks before. Salicylate of soda had already been given, in the usual doses, without effect, by another colleague. I prescribed ichthyol externally and internally. Before his departure, four days later, he presented himself before me again cured of the urticaria. He could not make up his mind to the internal use of the ichthyol pills, and therefore sedulously applied the ichthyol externally. The cure remained permanent."

I must reserve my cases of dermatitis herpetiformis, on account of their manifold interest, for a separate discussion, and I return again to the parasitic eczemas for the purpose

of joining with these the remaining parasitic diseases of the skin in which ichthyol is a useful application. One of the most important parasitic eczemas is the genuine scrofulous, or, as is much better, speaking without circumlocution, tuberculous eczema. It is amply characterized as such by the seizure of the mucous orifices of the head, the rhinitis complicating it, otitis media, blepharitis ciliaris, conjunctivitis, and keratitis phlyctænulosa, and the never-failing glandular swelling of the neck with its tendency to caseation. It attacks children only, and one sees by a mere superficial observation of them, when the entire body suffers in sympathy, that the disease has spread from the head down. In the beginning it presents a very different picture; here a simple eczema of the eyelids, there a perforation of the drum with fissured eczema of the particular ear-root; here a pillow-like eczema of the upper lip with compulsory and suspicious dry coryza, there a phlyctænular keratitis with blepharospasm and ring-like eczema of the skin near the eye due to the discharging tears.

In all cases which last more than two weeks we find a swelling of the lymph-glands belonging to the parts, and the tendency to lymphatic swelling of the subcutaneous tissues (scrofulous habit), to the formation of pus, production of blebs, and marked weeping is always seen. On the contrary, we seldom encounter small genuine eczema vesicles, yet less frequently do we meet the dry papules, and the itching, correspondingly, in these eczemas is not important. In short, the tuberculous eczema is a decidedly erythematous, weeping, crusting form of the disease, which, in opposition to other eczemas, tends to œdema, and is, moreover, on account of its peculiar topography, and the almost never-failing glandular swelling, so sharply characterized that, in the very beginning itself, a confusion with other eczemas is scarcely possible. If this eczema has reached its height, the poor children present a sad picture of degeneration. The entire head is swollen, the breathing is decidedly interfered with from swelling of the nose, the sight from corneal phlyctænæ and scars, the hearing from purulent otitis media, the hair of the head has fallen out, and the eczema, red and weeping, covers, in an irregular manner, the remaining portions of the body.

In small children nutrition is always impaired in a high degree, and signs of mesenteric tuberculosis are generally present; while older children frequently astonish one by the good quantity of their fatty layer, and their abdomens do not show the scrofulous habit; this is probably due to the fact that they infect themselves far less, in that they swallow less of the tubercular agent.

No. 11.—M., a girl of six years, came under my treatment in February, 1885. She had suffered in her third month with a weeping spot on the right ear, with consecutive swelling of the submaxillary glands, some of which formed pus. The fistulæ remaining are now closed. In her second year otitis media of both ears appeared in addition. The child does not respond when called, does not hear a watch, and understands her mother only. The conjunctivæ are hyperæmic; cloudiness of the cornea not present. The upper lip is markedly swollen; the skin of the entire face is dark and covered with mattery crusts; all the cervical and inferior maxillary glands are swollen and hardened. The abdomen, breasts, and extremities show, here and there only, weeping, crusty, or reddened eczematous places. Nutrition in general is bad; the child is thin, without appetite, often cannot be induced to eat, yet no signs of abdominal tuberculosis are found; lungs free.

February 6.—Internally, five drops of ichthyol daily; externally, rubbings with lime-water and oil only, till the crusts fall off.

February 16.—The eczema everywhere has assumed a dry character. In addition to the oil, washings with ichthyol soap are ordered.

February 19.—These latter are not well borne, as weeping places again appear. The following liniment is to be rubbed thrice daily over the entire body: Ichthyol, 10; aq. calcis, ol. olivar., āā 200.

February 28.—The child has improved in every way. The eczema is limited, dry, and paler. The appetite has returned again.

March 19.—Eczema almost well. Remains of it seen only on the neck, back, and scalp. Appetite is excellent, and weight markedly increased.

April 14.—The child is completely changed; has become stout. The pus-discharge from the ear ceased four weeks ago. The eczema has entirely disappeared in all places, and the swollen glands likewise, only on the right side, at the angle of the inferior maxilla, some enlarged glands can be felt. Blepharitis and coryza are still present to a slight extent. The sharpness of hearing is materially improved: a watch can be heard on the left side at a distance of one and a half inches, on the right at eight inches. The child takes part in conversation; the hair has grown thick again.

I did not see the child again, since she lived at a distance, but heard from the mother, two months later, that she was completely well, and had really "returned to life again." During the entire time nothing else was done than to take internally five drops of ichthyol daily, and to apply externally the ichthyol liniment.

Another group of parasitic eczemas now meets us in the different varieties of intertrigo. There is no doubt that one chief cause why these grow worse in their extension and great obstinacy—especially in children and stout persons—is the never-failing hypersecretion of the convoluted glands which here lie normally specially close together; that the greater warmth of the skin, covering and rubbing them, adds a second cause of injury. But the true cause of all intertrigos, without exception, it seems to me, must be sought in the presence of specific parasites, of which there seem to be several varieties, arguing from the different clinical forms of the eruption. If from an itching and weeping dermatosis of the axilla or cruro-scrotal fold an eczema starts—which further spreads out in dryer collections—if the intertriginous portion is limited by a sharply-defined border against the healthy skin, and if over this border, round or oval, sharply defined, reddish spots invade the healthy skin, then we have sufficient clinical evidence to be able to accept the admixture of specific organisms until further proof is advanced against this. This parasitic character has, as is well known, for a long time been proved for eczema marginatum, which originates as a distinct disease, very frequently, but not always, intertriginous in character.

Ichthyol has shown itself to be a very rapidly-acting remedy against these intertriginous diseases. It is best, from the very start, to rub in a strong (at least ten-per-cent.) ichthyol salve. If the wounded reddened portion is still small and the disease only one or two days old, a single application is generally sufficient to root out the disease. In this category belongs the chafing, popularly called "wolf," after severe marching and riding in summer. If the skin-complaint is old, the skin infiltrated, and a specially elevated border formed, then the frequent application of ichthyol salve is necessary. In these cases I find that a mixture of ichthyol and superfatty potash soap in equal parts is more suitable. Frequently one application of this mixture is sufficient to effect a cure. The mixture is applied like an ordinary salve, and then, by means of the fingers, which are frequently moistened, or of a bit of cotton, sponge, etc., rubbed up into foam, which is permitted to dry on. This method of using is not merely more effectual but also cleaner.

Finally, with old marginated eczemas a strong combination of salicylic acid (2-10) is advisable, in order to accelerate the cure. In reference to this latter combination, I will not omit to notice that neither the potash soap nor the salicylic acid is wont to cure these forms of eczema, and in any event they make a far longer and more unpleasant treatment necessary. The two forms of eczema mentioned are for the present the only ones among the parasitic eczemas in which I am able to suggest ichthyol alone as a satisfactory remedy. For the others it is an adjuvant remedy of not a little value, which in weak doses (1-3) accelerates the drying up of weeping surfaces, in strong doses (10-50) effects the absorption of firm infiltrations. The most of these, such as eczema parasiticum limited to the bends of the joints, the psoriatic form of eczema like psoriasis, that form called by me formerly eczema flavum (now eczema folliculorum, after Malcolm Morris and others), are easily removed, without ichthyol, by salicylic acid and zinc ointment combined in different proportions in ointments.

Among the parasitic eczemas I include two affections which find in ichthyol a good antidote, viz., pityriasis capitis and the so-called seborrhœa sicca capitis, including also eczema

seborrhoicum sometimes springing out of these. I recommended for these affections, some years ago, the treatment with simple sulphur ointment, and, so far as I know, this has always been followed by good results in the hands of all my colleagues who have adopted this method. There would be therefore no reason for supplanting this at times with the always more unpleasant and dearer treatment by means of strong ichthyol ointments if the sulphur treatment, outside of the already-mentioned contraindications (idiosyncrasy of many conjunctivæ, necessity of avoiding salts of lead and mercury), was not accompanied, in these cases, with this inconvenience, that a small quantity of sulphur always remains in the hair, thus causing it to appear as if dusty or powdered. This condition is, certainly, only with very dark hair so noticeable that it proves, now and again, a hinderance to the sulphur treatment. It is therefore not only theoretically interesting but also practically important to know that in such cases ichthyol, for which none of these contraindications exist, can in strong doses supply the place of sulphur.

For furuncles we have in the mercurial plaster mull such an effective and convenient remedy that it seems almost unnecessary to recommend ichthyol. But every plaster treatment has certain limits, at which it ceases to be practical and convenient, as, for example, in furuncles of the scalp. The application of plasters to hairy places makes oft-repeated shaving necessary. It is therefore desirable to possess just as good a remedy which can be easily rubbed into the hairy part in salve form. Such an one is ichthyol. The concentration of the ointment must be strong ($10-50\frac{1}{4}$), corresponding to the healthy epidermis and the deep position of the inflamed sebaceous and sweat glands. Still more applicable is a combination with equal parts of superfatty potash soap, because the formation of a lather by rubbing with the soapy ointment is cleaner and the ichthyol can be used by day even on uncovered spots, such as the beard and border of the hair on the neck.

With these skin diseases, caused by cocci, is included erysipeloid (not less important than erysipelas), recently amply

described by Rosenbach. The form of the ichthyol application here is chiefly dependent upon the seat of the trouble. The dose must be as strong as possible, except in erysipeloid, where the painting upon the part of a five-per-cent. watery solution is sufficient to produce a rapid cure. On the scalp we are restricted to the use of twenty- to fifty-per-cent. ichthyol salves, or salve soaps, which are to be pencilled, twice daily, in a thin layer between the hairs, upon which a flannel or woollen cap is then placed. When fever runs high ice-bladders can be applied, although they retard the absorption of the medicament. But in this case I prefer the ichthyol-alcohol-ether spray and apply the ice-bladder afterwards upon the head. On the extremities we may possibly prefer to apply ichthyol in the following way:

R Ammon. sulphoichthyolici,
Spirit. ætheris, aa 10.0;
Collodii, 20.0. M.

Sig.—Brush in the cork, or in the form of ichthyol mull salve, which is just as clean and which is covered with gutta-percha paper and bound down, or, finally, in the form of ichthyol plaster mull; on the trunk the latter; in the face the former, will compete with the ichthyol collodion. Erysipelas, under this treatment, is at once limited, the tension of the skin ceases, the swelling passes away, and the process is ended in a few days with the exfoliation of a brown horny layer. With wandering erysipelas the best thing to do is to rub the entire body with a strong ichthyol salve.

Among those affections which can be healed by the use of ichthyol, I include three other important diseases, in which it has, hitherto, according to my experience, played the rôle of an adjuvant only. These diseases are leprosy,* psoriasis, syphilis, and lupus. To the many erroneous statements, about a curative action of ichthyol in psoriasis, which I am meeting second and third hand, in reports of my first paper on ichthyol, I must oppose the fact that I *never* asserted such an action, and, to-day also, still hold to this negative view. A true cure by means of ichthyol I have seen only in two light, just-beginning cases of psoriasis occurring in children. These

* Leprosy studies, *Ergänzungsheft der Monatshefte für praktische Dermatologie*, 1885.

exceptions are practically out of the question. On the contrary, ichthyol is now and again useful in the course of a psoriasis treatment, partly (combined with tar and chrysarobin) to avoid the production of erythemas and boils, partly as an intermediate treatment (if the stronger remedies must be omitted on account of symptoms of irritation), partly internally, after arsenic has produced catarrhal symptoms; moreover, I have seen in some cases—but only in children—similar results to those obtained from arsenic from the internal administration of ichthyol only.

Ichthyol plays a similar *rôle* as an adjuvant in lupus. If, by any mechanical or chemical treatment whatever, the collection of lupus papules in the skin has been destroyed, and only an irregular, partly wounded, partly cornified, place remains, or at one spot a blue-red, swollen, pillow-like surface is present, while at another it is covered with crusts, then it is of great advantage to have an ichthyol salve (5-10) applied, or the corresponding salve or plaster mull. A brownish, dry, horny layer is formed under which the wounded places cornify; the elevations flatten out; those which are colored blue pale away; and, after its desquamation, the skin, normally colored again and pale, permits much easier the recognition of any traces of lupus which may be present. In the same way a ten-per-cent. ichthyol salve is to be recommended for the after-treatment of a lupus treated in the usual manner; it bleaches the skin and flattens out the scar. Ichthyol is of value in sycosis only when prescribed in the tested combinations with tar and potash soap. My composition with ichthyol joins the many modifications given by Hebra and others of Wilkinson's ointment. I use this exclusively, so that I may be unhindered in the intercurrent use of mercurial remedies. It consists of two parts superfatty potash soap, two parts olei cadini, and one part ammon. sulphoichthyol, and has the merit of being able to be rubbed in as a suds, and thus to be made less visible.

Among the tumors of the skin, I have, up to the present time, only treated the pointed condyloma and keloid with ichthyol, both with good results. In regard to the former, I recommend ichthyol only in the extended forms of condyloma,

those not suitable for excision; here it is to be applied pure, by means of a brush; a procedure which must be continued several days in succession, and ends with the falling off, without scars, of the pointed warts. Then, to prevent relapses, ichthyol must still be painted on the parts for some time. In keloid, ichthyol collodion, or concentrated ichthyol salve soap, is to be recommended, according to the location, whether it be on hairy or non-hairy places. In every instance a marked flattening appears, though not as promptly as after the resorcin treatment (*vide* Resorcin). The ichthyol treatment can likewise be recommended for extensive and deep scars of the face, such as frequently remain after small-pox and acne. For this purpose it is best to apply daily a strong ichthyol ointment or collodion, thus producing a firm mask-like crust on the entire face, which, after its fall, leaves behind a softer skin with flatter scars. This treatment—which of course interferes with the occupation—can be repeated as often as desired, and leads finally to almost complete disappearance of the scars.

Ichthyol has proven very useful in burns, since it, in part, notably lessens their pain and, in part, paralyzes their effects. The chief value seems to me to consist, when immediately used, in preventing the formation of blisters. If the burn is a very slight one, so that it has only produced hyperæmia or slight wale or callus (burn of the first degree), the immediate application acts so that pain and every visible trace disappears in a short time. If we treat more intense burns, in part, with ichthyol, we note that the parts immediately ichthyolized show no blisters, while, on the remaining portions, the typical picture of a burn of the second degree is developed. The appearances on the skin either return perfectly to the normal or remain in the stage of a burn of the first degree, while a fine horny layer exfoliates. In this case also pain passes quickly away after the application. The cessation of pain in cases of burns seems to depend upon a specific antagonistic effect of ichthyol against the action of heat upon the nerves and blood-vessels of the skin, since, also, without burning, the pain, which the radiation of heat from a hot stove produces, can be materially lessened by pencilling an ichthyol salve or paste upon the skin. I recall

the above-mentioned case of rosacea. I have frequently had this experience, that persons who expose themselves decidedly to heat-radiation can successfully combat the skin affections resulting therefrom (erythemas, eczemas, swellings), if they make it a rule to anoint the parts beforehand with a moderately strong ichthyol ointment; on this account, and to prevent blistering in burns, it can be recommended that firemen, machinists, lockmakers, etc., who are exposed to extreme heat-radiation, should always have some pure ichthyol at hand. It has already been introduced in some factories.

I have as yet had no opportunity to treat burns of the third degree with ichthyol, and, moreover, I do not believe that it can, in these cases, compete with the iodoform paste of Altschul. In these last dermatoses we touch upon the realm of surgery, in which ichthyol as a therapeutic agent is yet as good as unknown. Perhaps the following observations will incite specialists in this branch to work up the field as yet lying fallow. Surgery has no want of bandaging appliances for sprains and after operations; still, the time has not yet come when the advantages and disadvantages, to antiseptis, of the many remedies recently come into vogue are weighed separately against each other.

A long time will still go by before unity is reached as to the position to which each single one must be, theoretically and practically, finally assigned. I believe that I am able to predict that ichthyol will not compete with the chief antiseptic remedies (carbolic acid and iodoform and sublimate), although it has an antiseptic action and can be used in all the ordinary forms of surgical dressings; indeed, it does not belong in the same category. Its advantages lie in another field, and it is, possibly, a service which dermatology may claim that she has pointed out to her surgical colleagues this side of their art, which up to this time has indeed been treated somewhat coldly. If we recall the discussion in the general part of this work, what follows seems easy to understand. It was there emphasized that the reducing remedies, in large doses, show a very different action if we bring them in contact with the epidermis, in the one case, or with the cutis itself, in the other.

Surgery which, more than all others, demands decided antiseptics can use ichthyol only in concentrated form, for only in such form does it act antiseptically. One sees at once that it would not be practicable to disinfect a cavity (caused by a wound) with ichthyol. In this case it will be completely put in the shade by a weak sublimate solution. But, on the other hand, one can leave ichthyol, in the concentrated form, in the cavity without ill results. It does not act as a foreign body, it excites no formation of pus, but acts much more decidedly, contracting, drying up, and constringing the connective tissue. After it is absorbed, the cavities which it filled are firmly united, without being filled with profuse granulation tissue, as is the case when iodoform is used. I have made use of this quality of the drug, without anything further, to bring about union in abscesses, periglandular pus-sacs, atheroma-cavities, and hydrocele. If the cavities contain pus, they must first be carefully washed out with one of the usual antiseptics. Ichthyol has only to compete with tincture of iodine in this union-producing quality, and has the advantage over it of absolute harmlessness. While injections of pure iodine tincture cause violent pain for a long time, the pain caused by ichthyol lasts invariably only a short time, about fifteen to twenty minutes, and gives place afterwards to complete freedom from sensibility. If one wishes to attain similar astringent effects in sutured wounds by an application upon the epidermis, he must be guided entirely by the thickness of the epidermis as a whole, and especially by the thickness of the horny layer. I would not advise painting a well-sutured wound of the prepuce with pure ichthyol, but rather with iodoform collodion. The surrounding horny layer would lift itself off and the beginning pus-formation prevent or destroy the primary union of the borders of the wound. On the contrary, the same method employed upon the hands, arms, and many other places on the body, will produce beautiful, scarcely visible cicatrices. Pure ichthyol can be used especially well in simple fissured wounds of the scalp. I have seen the most beautiful and rapid union take place, entirely void of pain or inflammation, in a goodly list of such kinds of scalp wounds, by simply pencilling on pure ich-

thyol without stitches or further dressing. Wherever, also, the natural healing takes place under a crust we can suitably supply the latter by means of this simple ichthyolizing of the parts. We thus attain the same result, in shorter time, with less pain, surer protection from infecting germs, and decidedly better scar.

One thus sees that ichthyol is not a dressing whose effects can be always settled by percentages, but it will be determined with reference to the tissue in question. It is not, like the antiseptics in the narrower sense, merely a disinfecting remedy, and protection against infection later on, but it influences the tissues in an active peculiar manner. One only understands then its use, as a remedy for the cure of wounds, as one industriously studies its action on living matter. In this respect I may be permitted to refer briefly to some personal experiences which, as I said, I care to have noted only as incentives to the surgical specialist.

The form of application by painting on pure ichthyol has almost always proved excellent in the cases just cited of fissured scalp wounds, since it makes stitches and bandages unnecessary; the same is true in small wounds of the fingers and hands. So erysipelatous inflammations, arising from wounds, can, by this means, be rapidly stopped. Finally, the treatment is suitable for all kinds of rheumatic diseases of muscles and tendons.

One form in which ichthyol, in weak watery solution, can be suitably used is the mull bandage, undressed and free from fat, upon which, from time to time, the two- to ten-per-cent. solution is dropped after it has been firmly applied to the part, moisture being retained by gutta-percha paper. This form of application is specially practicable in sprains, stretching, and tearing of single muscles and ligaments, since one fixes the parts in the simplest way by means of the moist bandage which has been applied, and, in addition, makes fresh medicinal applications without moving the limb. Massage only can compete with this method in the quickness of the results, but, as is well known, it is right painful. Lead-water and ice do not produce nearly as energetic an astringent action. The same form of application is to be recommended in swellings

and extravasation of blood resulting from contusions or squeezes, in blisters caused by burns, and erysipelatous inflammations, if these are located on the extremities. Ichthyol collodion has proved useful in my hands in intumescence of glands, cicatricial keloid, bursitis præpatellaris, in varices of all kinds. In epididymitis and inflammation of the spermatic cord I always give it the preference over tincture of iodine. Ichthyol—that is, ichthyol soap or plaster mull—possesses the same indications for rheumatic complaints.

If we now cast a glance upon ichthyol viewed as a whole in the light of the experience communicated in this article, we see that, for the greater part, its quality of causing contraction, anæmia, and opposing inflammation is exhausted. This quality, according to the discussion in the general part, comes out in fullest value whenever there is a normal thin epidermis,—abnormally firm, or at least *not* abnormally soft,—*e.g.*, in subcutaneous swellings and inflammations with intact epidermis (sprains or strains, subcutaneous hemorrhages, rheumatic processes, and boils); also in œdema, angiectasæ, inflammations, and new growths in the cutis, the epidermis not participating (as urticaria, lichen urticatus, rosacea, erysipelas, erysipeloid, lupus, lepra, keloid); also in inflammatory processes of the cutis with hyperkeratosis (acne), or at least without loss of epidermidal resistance (nervous eczemas, various forms of herpes, burns of the first and second degree); finally, in the parakeratoses (pityriasis, “seborrhœa sicca,” ichthyosis, or psoriasis); because in these cases we can have recourse to the strongest doses of ichthyol. In some cases, not so often encountered, ichthyol can also be given in high doses, without disadvantage, where a broken-down epidermis really contraindicates this method of treatment, as in the tubercular and intertriginous forms of eczema. We must, in such cases, assume that it acts directly on the micro-organism causing the disease and destroys it, and in this way brings about a cure before any injury of the epidermis can become manifest.

In all the remaining forms of eczema—which have been omitted in the special discussion as leading too far away—affecting specially tender, though otherwise healthy, epidermis,

ichthyol must be applied—*i.e.*, if one wishes to make use of its hyperæmia-lessening and inflammation-removing quality—in weak doses, as two- to five-per-cent. watery solutions alone, or two- to five-per-cent. combinations with other anti-eczematous remedies,—*e.g.*, zinc, lime, lead paste, the Hebra or Wilkinson salves. The internal dose of ichthyol in diseases of the skin is determined more from the susceptibility and idiosyncrasy of the individual than from the kind of dermatosis. One must always have the largest dose possible taken for the longest time possible, yet this will circulate in the skin only as the weakest dose. Then the internal dose is determined by the age of the patient, the general constitution, other diseases accompanying the skin affection, and a possible idiosyncrasy against the remedy. The smallest dose for children under two years is about two drops daily; for larger children and adults, five drops; one can easily increase the dose with most persons to five to ten drops (.75–1.5 gramme) of the ammon. sulphate of ichthyol, thrice daily, without any antipathy to the remedy appearing. Generally the latter is present only for the first few days, and gradually completely disappears. A bit of confectionery, some orange- or lemon-juice, is sufficient to remove the after-taste; children often take ichthyol very readily. If, in the beginning, nausea and eructations appear after taking the drug, still one never has to guard against real digestive disturbances caused by its use, since, on the contrary, there are few remedies which so surely—gradually but effectually—remove old stomach and intestinal catarrhs. It is always advisable to begin with small doses, but later to continue in the normal dose. Naturally, we will make use of the slow and steady-acting internal administration, especially in the very indolent, obstinate, and relapsing dermatoses (as rosacea, acne, eczema nervosum, dermatitis herpetiformis, urticaria chronica). The parakeratoses seem to be less influenced by the internal use, but are rapidly reached by the local ichthyol therapy.

My experience with resorcin extends over a much shorter period of time than with the ichthyol salt, and is not suited, therefore, in the same degree to conclusions universally available. I have only treated a small number of cases in the same

way as with that preparation,—by means of resorcin exclusively,—yet I believe it will serve to extend the sphere of use of resorcin in some measure, as this remedy, up to the present time, possesses its chief reputation as a therapeutic agent for infectious dermatoses, as erysipelas and for epithelioma, while only very meagre accounts of its action and method of using in chronic diseases of the skin exist.

I have had an especially favorable experience with resorcin in the treatment of the different parakeratoses, first of all with pityriasis capitis (alopecia pityrodes), with the dry seborrhœa of the head, and with seborrhœic eczema, which develops from both of these conditions. We have seen, as has already been noticed, that, now and again, contraindications exist to the ordinary sulphur treatment of these affections which seem to render this therapy—otherwise generally successful—impracticable in all cases. In such cases I have used, now for two years, instead of a strong (10–20 %) ichthyol ointment, or a (2–5 %) pyrogallic ointment, a (5–10 %) resorcin pomade. Of these three remedies, which can take the place of the sulphur therapy, the resorcin pomade proves the most serviceable practically. It is a fact in favor of the resorcin pomade that the brown tinge on the scalp, covered with fatty acids, does not appear when resorcin is used, while it always appears after using pyrogallic acid, although in a very diminished degree, and more slowly than anywhere else. Resorcin has, as a matter of course, the advantage over ichthyol of freedom from odor and color.

The strength of the resorcin ointment for these cases is determined by the accompanying symptoms of inflammation. The more pronounced these are, by so much the weaker is the ointment with which one begins the treatment,—*i.e.*, in marked cases of eczema seborrhoicum we begin with a two-per-cent. ointment and advance, corresponding to its decrease and the progress of the cure, to stronger ones,—five to ten per cent. or more; obstinate remnants of the disease often require a twenty- or thirty-per-cent. resorcin pomade. Ointments of this strength usually cause for a time burning. Washings with soap during the treatment with resorcin, which are necessary during the treatment with ichthyol, and which are to be avoided as far as possible

during the treatment with pyrogallol, are limited to a minimum of about once or twice per week, as is the case during the sulphur treatment.

For the parakeratoses, already cited, resorcin, like sulphur, is a satisfactory remedy. It has shown itself superior to sulphur, on the one hand, and to ichthyol, on the other, in the treatment of psoriasis. We can briefly define its action in these cases in this way,—that it about equals the action of a pyrogallic dose fourfold smaller. A two- to five-per-cent. pyrogallic salve just about corresponds to a ten- to twenty-per-cent. resorcin salve. On non-hairy places a strong resorcin plaster mull (20 per roll) has proved especially useful in some cases of psoriasis. Resorcin in this case is only one of our many palliative remedies. Relapses after a very thorough treatment are the rule. Resorcin plaster mull has this advantage only over pyrogallol and chrysarobin plaster mull, that it does not injure the healthy skin. With eczema, on the contrary, the limit of use of resorcin is more confined than that of ichthyol. There are in particular various dry and very itchy eczemas of the face for which resorcin represents a desirable remedy. Among these belong, first of all, eczema seborrhoicum, mentioned above, which has its origin in a pityriasis or seborrhœa cap; and generally extends first of all over the forehead, then the cheek and neck.

In the facial eczemas we begin, in general, with a salve or paste containing two per cent. of resorcin, and increase the dose proportionally to the progress of the cure; but in those instances where the patient is clinically treated, instead of ambulatorially, we always use at once the resorcin plaster mull (10–20 per roll), in the form of a partial or complete face mask. The itching, which up to this time was unbearable, is wont at once to lessen, and generally after a short time has disappeared. The entire horny layer, in so far as it is covered by the plaster, peels off, after two or three days, as a brown cohesive membrane, and leaves behind the skin of the face entirely or partly healed. But while this first effect of resorcin, especially when used as plaster mull, is frequently so surprising, it is also disappointing in not expediting the cure of the eczema further, but rather delays it. This is due to the fault of all

reducing remedies used in too strong doses, or too long. While, therefore, some eczemas of the face are healed very rapidly and definitely in the very beginning of their course, after a few desquamations of the horny layer, in others this improvement suddenly ceases, small new irruptions appear, and the advantage already won is again lost. An exact prognosis is nowhere harder to make than in eczema of the face, since, waiving the many external injurious agencies to be taken into consideration here, the finer diagnosis, in so far as it concerns the kind of eczema, is frequently not at all determined from the appearances in the face, but only from other localizations of the exanthem. Therefore I advise, in the clinical treatment of eczema of the face, a continuous use of the resorcin mask only as long as progress is noticeable, on its cessation to revert immediately to other remedies, especially salves, or plaster mulls, of zinc and red precipitate, or tår and zinc. The resorcin plaster mull possesses the same advantages in the troublesome itching eczemas of the scrotum as in eczemas of the face. We often obtain more certainly in these parasitic eczemas a stronger effect by a combination of two- to five-per-cent. of salicylic acid than through a corresponding increase of the dose of resorcin, just as I have mentioned above for ichthyol. A typical case of seborrhœic eczema, complicated with an epithelioma of the sebaceous glands of the nose and numerous soft warts, may serve as an example.

No. 12.—A. G., from H., a strong man, sixty-four years of age, entered my clinic on the 6th of March, 1886. For the last seven years he had noticed a collection of fatty scales on the head, without there being any very decided loss of hair. Two months ago, red itching places spread from the neck to the back, then upon the breast, and after preliminary itching and light scaling made their appearance in the beard. The red places on the neck, upon the upper part of the back, and the breast, especially over the sternum, showed the typical red form of circles running together into gyri, the centre of which was clear and generally colored yellow, while the somewhat elevated border appeared covered by fine fatty scales, which were always rapidly renewed after being washed off with soap.

On the neck the places were more elevated, the cutis itself thickened, infiltrated, and much scratched. In the beard, after the removal of the scales, red, very itchy places, likewise sharply limited, appeared. The upper portion of the back had, possibly in connection with the constant scratching in the latter period of the complaint, become the seat of a great number of soft fibromas already partly pedunculated. Upon the left ala of the nose a large epithelioma, the size of a ten-penny piece, was present, which had slowly developed in the last three years out of a wart which had existed for a long time. On back, breast, neck, and head the following ointment was rubbed in twice a day :

Resorcini, 10.0;
Ungt. pomadin., 30.0;
Lanolini, 60.0. M.

The same ointment was applied every two hours to the epithelioma of the nose. On the following day the itching was much less everywhere, the red places gradually became paler, the epithelioma, which originally rose above the level of the skin to the height of six millimetres, flattened, and on the third day three small masses the size of a mustard-seed fell out with slight hemorrhage, leaving behind a loss of substance corresponding to them in size.

March 12.—Seborrhœa on the breast healed; on the scalp and in the beard decidedly improved; likewise on the back, where many contiguous pedunculated warts had fallen off and the remaining ones had contracted or shrivelled up. The seborrhœic, infiltrated eczema of the neck proved obstinate, and was covered—from this time on—just like the epithelioma, with the resorcin plaster mull.

March 15.—Some places on the neck have formed matter while the entire horny layer is brown and dry like parchment paper. Bound with iodoform mull salve till it desquamates. The epithelioma, which, after removal of the macerated horny layer, was only one millimetre high, is covered with salicylic plaster mull, in order to hasten it in a greater degree.

March 20.—The seborrhœic eczema apparently healed everywhere. The epithelioma entirely disappeared to the level of

the skin. The eroded places were covered with salicylic creosote plaster mull.

April 10.—Cured; discharged.

Resorcin acts just as favorably in the frequently-encountered combinations of ichthyosis with a dry eczema as in the already-cited eczemas. I have already often emphasized this, that ichthyosis vulgaris is a parakeratosis, suspiciously parasitic, occurring endemically in certain districts, and the dry eczema appearing in connection with it I regard as a local increase of the ichthyotic process. Resorcin effects a cure in this disease just as well as sulphur, only still more rapidly. The scales fall off, without soap baths, and after a long time the coarse panel-like condition of the epidermis disappears, a result which never will be reached by simple inunctions with fat. An example of this condition also may be adduced.

No. 14.—F. M., of H., a boy of five years, otherwise healthy, was brought to my clinic on the 3d of February, 1886. In the first weeks of his life a collection of dry scales had appeared upon the head, and in the second year, upon the knees and elbows also, and then had spread successively over the entire body. The entire skin, with the exception of the joints and touching-surfaces, for example, like the hands and feet, was covered with gray, coarse panelled ichthyotic scales, preference being shown for the extensor surfaces. The skin of the face also was in a slight degree scaly, the scalp decidedly so. On the sides of the breast and of both thighs were some dry, reddish eczematous places. The entire body was rubbed, twice daily, with a five-per-cent. resorcin ointment. After a three-weeks use of the salve, bathing being only permitted twice for the sake of inspection, the boy was discharged cured. As an after-treatment the use of a two-per-cent. resorcin salve every evening was recommended. An inspection a month after showed the skin of the entire body absolutely normal, fine and white.

Resorcin has recently been warmly recommended by Ihle,* for sycosis. I can hardly confirm the good effect of it for

* S. *Monatshefte für pr. Derm*, 1885, page 424.

parasitic sycosis, accompanied with the formation of tubercles, which has been caused by infected razors. For subnasal folliculitis, on the contrary, which extends secondarily in the form of an ordinary sycosis, I find that the combination of tar, ichthyol, and superfatted potash soap, already given, leads much more rapidly and surely to the goal. Nevertheless, the researches in this direction ought to be continued.

Resorcin has further proved itself useful in the treatment of scars and scar keloids of the face, be they produced by small-pox, acne, or injuries. The reducing substances act just as favorably upon the humpy, elevated, keloid-like swellings as upon the deep, hard, fibrous bands extending through the cutis, which generally occur in these cases. We can favorably influence these callous new formations by the ichthyol salts (see above), pyrogallol and chrysarobin likewise, in a different degree. What gives resorcin a decided advantage over these substances, in the face, is again the negative advantage that it does not smell, and is not brown like ichthyol; that it does not render the skin black and superficially injure it, in a slight degree, in the way that pyrogallol does, and does not irritate the eyes like chrysarobin. In spite of this, treatment of scars can be carried out with these remedies, with the necessary precautions. The resorcin treatment of scars is one especially convenient and easily carried out by the patient himself. I am accustomed to use, for this purpose, resorcin salve mull, which is fixed at night upon the cicatricial part by rubbing, and which must somewhat more than cover the part itself. We then paint over the salve mull on the outside with several layers of collodion, observing the precaution of leaving the outer border of the mull free from collodion. One has thus an intense resorcin effect combined with strong pressure without the presence of the marked brown color caused by *plaster* mull, and without the tedious removal of remains of collodion and of tightly-sticking plasters, since the mull salve can be removed in the morning by a simple pull on the border free from collodion. After a time a horny layer, only moderately stained with yellow, scales off; we then use for a few days an emollient ointment till the scaling is completed. If stronger

remedies are needed, one changes, from time to time, alternating between the use of the resorcin salve mull and a strong ichthyol-salicyl salve or paste, likewise applied at night. A rubbing down of the skin with marble-dust should precede both. In this way one succeeds, in a short time, in markedly smoothing the skin of the face disfigured with scars without withdrawing the patient from his occupation. A consecutive use of this means, continued for months, leads finally to the definite removal of very decided cicatrices which have lasted for years, and have been considered incurable.

I can confirm throughout the favorable results of resorcin in erysipelas, the acute exanthems, and infectious dermatoses generally, which Andeer* communicated. These results are for me a matter of course, since they affect the entire reducing group mutually, although in very different gradations. Resorcin has here, again, the agreeable quality—often touched upon—of freedom of color and odor and a relative harmlessness.

No. 15.—To mention only one more interesting case: I observed two years ago a peculiar small-pox-like dermatosis, which developed on the backs of both hands of a helper in a military hospital, in connection with the autopsy of a typhoid patient; this rapidly extended over both arms, with swelling of the elbow and axillary glands, but in a few days rapidly dried up under a twenty-per-cent. resorcin salve with desquamation of the arms.

I am convinced, from my own observation of a great number of acute exanthemata, that, in the future, resorcin will be called to play a *rôle* in the therapy, developed upon dermatological principles, of the acute exanthemata,—above all, scarlatina and variola. On the definite results of resorcin in epitheliomas I can report less independently, since I used the drug, in the few cases which were at my command, only with salicylic acid. Yet I do not question for a moment the (at least momentarily) favorable results which others have attained, for it lies in the nature of all reducing remedies, when used in concentrated form, on the one hand to produce desquamation of the epidermic cells, and on the other to put a stop to infectious

* S. Monatshefte f. pr. Derm., 1884.

processes by reduction, and possibly, in the future, cancers will prove to be parasitic diseases. In any event, in the future it will be the aim of the surgeon, who has at command the richest and most competent material, to use the remedy described in these pages more than has been done up to the present time, not only alone, but also in combination with salicylic acid.

The facts here communicated on the use of resorcin in the realm of real chronic dermatoses, though they are deficient, will yet serve to show that a greater sphere of action belongs to resorcin in this field than has hitherto been ascribed to it. If we should particularize its position in general, we have learned to look upon it as a reducing remedy which in the intensity of its action holds about the middle ground between sulphur and ichthyol on the one hand, and pyrogallol and chrysarobin on the other. With the former it shares extended availability in inflammatory dermatoses; with the latter, activity on very indolent, obstinate affections of the skin. It has certain negative advantages over all of them, viz., the lack of producing irritating and injurious effects near by, and is on this account especially suited to the ambulatory treatment of some obstinate diseases of the skin, especially of the face. On the contrary, it falls behind the weaker reducing remedies, such as sulphur and ichthyol, in this respect, that its application in chronic dermatoses can only be an external one, thus classing it, in this respect, with pyrogallol and chrysarobin.

I have sought in the preceding pages to give, in a few lines, my experience, obtained in the last three years, with ichthyol and resorcin separately, and at the same time to bring out an agreement with a universal law. I hope that this connection, which impressed itself upon me in practice long before I was able to put it into words, will make the application of these remedies easier for other physicians; for the indications of modern dermato-therapy have become so unusually complicated that they must be the concern of the specialist only, and thus unfruitful for general practice, until we shall succeed in arranging the chaos of therapeutic observations of single individuals so that they may be considered from universally-understood points of view. Whether these views are offered us from the pharma-

cological side, or whether they are shown by induction (through the experiments of practice), that, it seems to me, is all one, so far as the practical result is concerned. For, in the end, practice alone determines the truth of the therapeutic ideas which guide us, and so I conclude, and again affirm, that the view here given of a natural relationship of the remedies, up to this time considered as heterogeneous, has grown upon therapeutic soil, that it will also hold its right practically, even if further chemical researches should show that the reducing remedies do not represent, just in the way I consider probable, one pharmacological group.

HAMBURG, April, 1886.