porating it with successive very thin layers of cotton-wool so that it forms a sort of protecting mat over the area treated, and any stickiness of the mat's surface can be obviated by dusting it over with a simple powder.

Another useful method of protection is the employment of a substance called pellanthum. This is a sort of liquid ointment incorporating a good deal of zinc, which can be squeezed out of a tube, and dries on the surface to form a protective coating. It is non-greasy, and it is consequently often popular with patients, but it does not suit everybody, as it contains a certain amount of water.

Stimulating Treatment

Up to the present I have considered protective measures alone in the treatment of dermatitis or eczema, but I regret to confess that there are many cases which will not respond to these measures alone. There is an old dermatological adage that in acute cases soothing is required but in chronic cases stimulation is necessary. This is true to a certain extent, but the stimulation must be practised with great caution, for stimulation is closely akin to irritation, and we must always beware of causing irritation. Nevertheless, here I want to point out certain indications for the use of additional substances which may from time to time be incorporated with advantage in the simple protective preparations to which, up to the present, I have limited myself.

The first of these conditions is the formation of crusts and scales. These consist of imperfectly formed horny cells, which are thrown off before their time from inflamed surfaces. Their removal is greatly facilitated by the presence of salicylic acid in the ointment applied; 10 grains to the ounce is sufficient. Sometimes, in the case of old patches where the oedema of the skin is not marked, showing that the inflammation is not very intense, improvement can be achieved by the incorporation of 1 or 2 per cent. of liquor picis carbonis in the ointment, or occasionally by painting the surface three or four times a week with liquor picis carbonis pure. This measure often also dries up groups of discrete eczematous papules which are threatening to coalesce to form a patch. Crude coal tar may also be incorporated (to the extent of 1 to 2 per cent.) in the simple protective ointment; this appears to be most useful in infantile eczema. Occasionally, too, painting with a solution of silver nitrate of 1 to 3 per cent. strength will cure troublesome fissures and cracks. Another solution that may also be used with advantage is Bonney's paint, which consists of 1/2 per cent. solution of brilliant green and crystal violet in a 10 per cent. solution of spirit, but it is hardly ever possible to prophesy in any particular case which of these solutions is most likely to be of benefit. It is still a question of trial and error.

X Rays in Treatment of Dermatitis

I cannot conclude my remarks on the subject of the treatment of dermatitis without a brief reference to the virtues of x rays in this branch of therapeutics. Personally I do not know how I could get on without them. There is no other single therapeutic agent which is of equal value in the treatment of chronic skin disease, especially, perhaps, of chronic dermatitis. Used with skill and caution they frequently produce the most miraculous effects, and clear up cases which have previously resisted all the wiles of the apostles of protection and stimulation. The opportunity possessed by the specialist of employing x rays is the sole advantage he has over the ordinary practitioner in the treatment of chronic dermatitis. I do not here propose to go into the details of the technique of their administration, but will only say that given in

doses not exceeding half a Sabouraud pastille at fortnightly intervals with a maximum of three doses in succession, and then at least a month's interval before they are used again the results are very gratifying. What is more, given in this way I have never seen the least harm result, although I am well aware of the terrible effects that have been caused by x rays injudiciously administered.

(I have said nothing of the internal treatment of dermatitis—that is another and less satisfactory story.)

THE STREPTOCOCCAL DERMATOSES WITH SPECIAL REFERENCE TO THOSE OTHER THAN IMPETIGO

BY

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It is to the work of Sabouraud that we owe most of our knowledge of the streptococcal diseases of the skin, but though he has for more than thirty years expressed his emphatic views on the subject both in teaching and in writing, and though his doctrines are largely accepted in France at least, they are only slowly percolating into dermatological teaching in this country, and time and again one comes across, in published papers and in textbooks, a remarkable ignorance of his work. Speaking of chronic streptococcal infection of the scalp he states: "It was and is still confused among the impetiginous eczemas (?) or has even, by a flagrant impropriety of terminology, been called seborrhoeic eczema." Such confusion is extremely common in this country, and as I have for the past six years endeavoured to study my cases of streptococcal infection from Sabouraud's point of view, and am convinced of the correctness of his teaching, I have thought it worth while to review my records of these cases in some detail.

Briefly, Sabouraud considers as streptococcal in origin the following diseases: *impetigo*; certain forms of *intertrigo*, especially of the fold behind the ear; a more or less extensive form of *dermatitis* seen typically on the scalp but with possible extension more or less all over the body with a predilection for the folds; and *pityriasis alba*, "dartre volante" of the French. His bacteriological research has not taken him beyond the recognition of the presence of streptococci in cultures from these lesions, and when I² endeavoured to proceed further in the identification of the streptococci responsible for these diseases it became evident that, while a haemolytic streptococcus—a streptococcus as great in haemolytic power as that responsible for surgical affections—was recoverable from the acute streptococcal infection of the skin we know as impetigo, from the other conditions—intertrigo, dermatitis, and pityriasis—an entirely different type was isolated—namely, an anhaemolytic streptococcus. It is noteworthy that these conditions, though they may be acute in onset, tend to run a chronic course, and may persist for years. I do not intend to say much about impetigo, as I have little new to offer. That it is a streptococcal disease is now generally recognized, and with appropriate treatment it ought to be cured in ten days or so.

Streptococcal Dermatitis: Symptomatology

The typical lesion in the other type of infection is that of the fold behind the ear—an intertrigo. In mild cases it may not be noticed till the ear is pulled forward, when a red weeping surface is disclosed. The lesion is greatest

at the bottom of the fold, and here can be seen a very common feature: as the ear is pulled further forward a fissure suddenly appears along the line of the fold exuding a few drops of blood. The margins of the affected area are more or less scaly and crusted, depending on the stage of the disease. When established there is a copious discharge of serum from all over the affected area; there is no scaling, but crusting may be marked. Later, as the secretion lessens, scaling becomes more and more evident, crusting becomes less, and the condition disappears by becoming a more or less completely dry pityriasis. The redness fades, and the scaling gradually diminishes.

Out of 176 cases of streptococcal dermatitis (in which term I included intertrigo and pityriasis, as well as dermatitis *per se*) infection of the post-auricular fold was absent in only 15. On the other hand, I am convinced that every case of retro-auricular intertrigo can be regarded as streptococcal in origin. An anhaemolytic streptococcus can be isolated from every case, and the writer was struck by the remarkable purity of the culture which could frequently be obtained from this situation. This is not the case—and one cannot be surprised at the fact—with a streptococcal dermatitis, say, of the scalp. As will be seen later, streptococcal dermatitis may complicate other diseases, but even in a case of frank seborrhoea of the scalp, where the post-auricular fold is affected in this manner, we may be sure that, in this site at least, we are dealing with a streptococcal infection.

Though the infection may be confined for a long period, even for years, to the retro-auricular fold, extension is very apt to occur to the scalp, and the typical streptococcal dermatitis results—a condition easily recognizable clinically, and possessing the definite characteristics. The same features as are found in intertrigo are seen, modified by the locality.

The whole area presents a red glazed appearance, and there is abundant exudation of serum from its entire surface. The appearance differs entirely from that of eczema. There is no vesiculation, there are no "pits" from which the serum appears; it comes uniformly from the inflamed skin, the "exoserosis" of Sabouraud. If the serum is allowed to dry it forms crusts which mat the hair, but there is a distinct difference from impetigo in the continuity of the lesion—streptococcal dermatitis spreads by contiguity, impetigo by fusion of separate lesions, and in the latter disease one never sees such universal involvement of a large area of the skin; there are areas of more or less sound skin between the impetiginous lesions. As will be mentioned later, a combination of the two diseases often occurs.

If crusts are removed little depressions can be seen scattered over the scalp, but a close examination will show these to be the mouths of the hair follicles, which gape to some extent. The whole scalp looks tight and rigid over the cranium, and after a few weeks there usually occurs a more or less general defluvium of hair on the affected area, sometimes leaving it entirely bald. This is no disadvantage, as it is a great aid to treatment and is invariably temporary. As regression sets in the same features are observed as in the intertrigo: the serous discharge becomes less, scaling gradually takes the place of crusting, the redness fades, and a dry pityriasis is left.

Other folds besides those of the ears are frequently involved. The conjunctival fold may be affected, giving rise to a conjunctivitis, and, especially in infants, the creases of the neck can be the seat of this disease. The axillae, groins, and umbilicus may be involved, and also the folds under pendulous breasts in women. From any of these sites the disease may spread to the neighbouring skin, and the whole surface of the body may become

affected. To diagnose the condition one must pay attention to the clinical appearance of the disease, remembering that the folds are the regions most seriously involved, and look behind the ears. The presence of intertrigo in this situation often gives the clue to the cause of a generalized dermatitis, perhaps so attenuated that the clinical picture is doubtful.

Though retro-auricular intertrigo is perhaps the commonest origin of a streptococcal dermatitis, it may commence on the scalp, as is so often the case with impetigo, secondarily to a pediculous infection, but the ears soon become involved, and the appearance of the disease when fully established is the same.

Duration of Infection, Incidence, and Complications

The persistence of infection in the superficial layers of the skin is one of the most surprising facts in dermatology. It is not at all uncommon. Ringworm of the scalp, tinea versicolor, and pityriasis simplex (dandruff) may all persist for years, yet in none of them does the parasite penetrate below the horny layer. Sycosis, the chronic staphylococcal infection, has a similar indefinite duration, and we find the same in streptococcal dermatitis. Untreated or incorrectly treated, the disease may last for years, sometimes appearing to regress and again spreading more or less rapidly to its former extent or even further. Early in my investigation this persistence of the infection was brought home to me. One of the first cases I examined bacteriologically was that of a child of 2, who had been under antiseptic treatment in my ward for three months, yet the *Streptococcus anhaemolyticus* was easily isolated from the lesions. Even with appropriate treatment one cannot expect cure of an extensive case in less than about three months, and too often a child almost cured ceases to attend, with the result that he reappears in a week or two as bad as ever.

The records of the skin out-patient department of the Dundee Royal Infirmary show 141 cases of streptococcal dermatitis out of 4,146 patients—an incidence of 3.4 per cent., which corresponds very closely with Haxthausen's³ incidence of 3.2 per cent. in 4,700 patients attending the Polyclinic of the State Hospital in Copenhagen. The latter, however, included patients suffering from venereal diseases, which my own do not. Out of my cases 42 per cent. were males and 58 per cent. females. J. Goodwin Tomkinson⁴ gives corresponding figures for impetigo as 47 per cent. males and 53 per cent. females in 1,107 cases. The similarity of the age-incidence curves of streptococcal dermatitis and impetigo is shown in the two charts (page 293). These two diseases are caused by similar micro-organisms: no "seborrhoeic" disease could possibly give this form of graph. Though streptococcal dermatitis is certainly more common in the hospital class of patient, dirt and neglect being responsible for the extension and continuance of the disease, mild cases, especially slight retro-auricular intertrigo, can be found not infrequently in patients from any walk of life.

Streptococcal dermatitis may be found in conjunction with other infections of the scalp, especially impetigo and follicular staphylococcal infection. Clinically they can be readily recognized, and with regard to the former disease I have been able to isolate the two types of streptococci where impetigo and streptococcal dermatitis were both present. A staphylococcal infection can be differentiated by the presence of definite pustules round the hair follicles, a condition never present in uncomplicated streptococcal infection. With regard to seborrhoea, Chart I shows a slight increase in incidence between 20 and 30, and this is detectable slightly later in Chart II. In my opinion the seborrhoeic skin is more prone to both forms of streptococcal infection than the normal, but not to any marked degree.

Treatment

One of the strongest proofs that streptococcal dermatitis is not an eczema is afforded by its response to treatment. Treatment suitable for eczema is of no value in this disease; the prolonged use of a suitable antiseptic is required. I tried the local application of a vaccine made from *S. anhaemolyticus* grown from several cases, but the results were disappointing.

Attention to detail is always necessary in medicine, and never more than when dealing with streptococcal dermatitis. Treatment should not be left in the parents' hands; it is somewhat, but not unduly, painful, and the pain is over as soon as the treatment is completed. Parents cannot be expected to adopt the required impersonal attitude. They are usually over-cautious and liable to under-treat; or, much more rarely, are unsympathetic, rough, and liable to over-treat. The first requirement, then, is the daily attention of a qualified nurse who thoroughly understands what is expected of her. In large towns this can be arranged for in hospital or other clinic, and in the country the district nurse

CHART I.—Incidence of streptococcal dermatitis in five-yearly periods.

is a valuable asset. In-patient treatment is not an advantage, unless for the reason that adequate treatment cannot be obtained outside (usually due to home neglect) or in the most extensive cases, which should be discharged as soon as possible. As normal a life as possible, with fresh air (not direct sunlight) and moderate exercise, helps the cure, prolonged hospitalization being of no advantage, and merely a waste of money.

Pastes and ointments of all descriptions have proved very disappointing in my hands, as they appear to encourage the growth of the streptococcus. I prefer to use a liquid antiseptic, and, after experimenting with, among other things, various aniline dyes, eau d'Alibour (copper and zinc sulphate solution), silver nitrate solution, and iodine, I pin my faith to iodine in 1 per cent. solution (it should not be used stronger or it will irritate). This can be applied either in spirit or, as I prefer it, in carbon tetrachloride. The latter is slightly less painful, is a better solvent of grease, and is less staining than the spirituous solution.

TECHNIQUE

The following is thus the scheme of treatment:

1. The hair is cut short and kept short. This means about one-eighth of an inch long, and entails repeating the clipping once or twice a week. As early as 1928 I used epilation by thallium acetate (as advised by

O'Donovan), but gave it up, not because epilation was unsatisfactory or dangerous, but because a three-weeks wait was required before it was complete and because the very rapid re-growth necessitated recourse to the clippers after all.

2. Crusts and scales are removed by boric-starch poultices. The parents are carefully instructed how to prepare and apply them (I have been able to improve upon the excellent and detailed instructions given by Sir Norman Walker⁶). This can be done at home, and is repeated as often as necessary. At first it will have to be done every day or every other day, but as the disease regresses the intervals can be increased.

3. The 1 per cent. solution of iodine is applied daily. The method of application is important. The first few applications should be made cautiously to establish confidence between nurse and patient and also because the smarting becomes less as the treatment goes on. The aim should be to rub the solution in as firmly as possible without causing the lesions to bleed. For the

CHART II.—Incidence of impetigo in five-yearly periods. (Dr. J. Goodwin Tomkinson's figures.)

folds behind the ears a pledget of cotton is wrapped round a match-stick, dipped in the solution, and rubbed quite firmly into the fold; for the rest cotton-wool soaked in the solution is sufficient. For the eyes weak zinc sulphate-boric lotion is probably best.

4. As far as possible the lesions should be left exposed, but at night and where home conditions are dirty a light dry dressing may be necessary.

5. The co-operation of parents must be obtained; especially must they be warned to apply no treatment on their own. If they are not impressed with the necessity for avoiding greasy applications they are apt, on the mistaken idea that the scalp is being kept too dry, to apply olive oil, patent or other ointments of all kinds—usually only once, as the deterioration in the child's condition is then apparent even to them.

GENERAL HINTS

No change in the treatment is necessary till cure is complete, except that when the fine, dry, scaly stage on the scalp is reached—the face is usually clear by this time—the poulticing may be stopped and bi-weekly washing with soap spirit instituted, or the following shampoo instead.

Oil of cade	...	...	...	2 parts
Thymol	...	...	...	1 part
Green soap	...	...	...	33 parts
Methylated spirit	...	...	to	100 "

This should be well rubbed into the scalp, left for a few minutes, and then rinsed off with water. If there is any sign of increase in the irritation the shampooing should be stopped and the poultices resumed.

Where the body is extensively involved, and for the folds such as the axillae or groins, the application of a calamine cream, slightly carbolized, is often advantageous—for example:

Prepared calamine	...	...	...	9 parts
Zinc oxide	...	...	...	9 "
Glycerin of carbolic acid	...	...	...	2 "
Olive oil	...	...	...	40 "
Lime-water	...	...	...	40 "

It should be applied after the iodine has dried, and must be completely removed each day before re-dressing.

I have found that where a case of streptococcal dermatitis of the scalp is rebellious to treatment, elastoplast dressings may be used to advantage. They are applied in strips to cover the whole scalp and left on for a week. The hair must, of course, be as short as possible before application, and must be clipped each time the dressing is renewed. Removal is not too painful if care is taken to strip the scalp slowly and in the direction the hair grows. It takes courage at first to employ this method, and after the first week there is usually abundant pus below the dressing, but when the scalp is cleaned it will be found to be definitely less inflamed, and the dressing is reapplied with more confidence. I find that six of such weekly dressings are usually sufficient to bring the scalp almost to the dry pityriasis stage, where iodine completes the cure. No form of eczema has responded in this way to elastoplast in my experience; on the other hand, eczema is made worse by elastoplast.

It is of extreme importance that treatment be continued till every trace of the disease has gone, or it will surely return. Treatment should be stopped gradually. The daily application becomes thrice weekly, then twice, then once a week. Even when apparently cured the patient should be warned to report at once if there is any sign of recurrence, which can in the majority of cases be easily checked if the above treatment is promptly resumed.

Summary

I have endeavoured to describe briefly, and from my own observations, the manner in which streptococci may give rise to a dermatitis, and to show that, apart from impetigo, streptococci may cause an intertrigo, an exudative dermatitis, or a pityriasis. I believe that these conditions are not eczemas and that they have no connexion with seborrhoea. This entirely confirms the views of Sabouraud.

My experience also points to the fact that, while impetigo is caused by a haemolytic streptococcus, these other diseases are due to the action of an anhaemolytic streptococcus. This fact explains certain differences and certain similarities in the two groups.

The term "streptococcal dermatitis" is suggested as the most correct and convenient form of nomenclature for this latter group.

Suitable treatment is suggested.

I have to acknowledge with thanks Dr. Tomkinson's permission to use his figures for Chart II.

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THE DIAGNOSIS OF EARLY PULMONARY TUBERCULOSIS*

BY

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One cannot begin a discussion on the "early case of pulmonary tuberculosis" without first trying to answer the question, "What is the early case?"

A girl whose face recalls an Elizabethan love lyric and whose age is sweet and twenty complains of a cough that has lasted for two or three weeks, of blood-spitting, of lassitude. The physical signs in the chest are unhelpful, but we examine the sputum, and tubercle bacilli are scattered about like red Chinese characters on a blue scroll, and we take a skiagram and see a cavity the size of a shilling surrounded by a diffuse haze or set about with fluffy mottling. On close inspection we perhaps perceive a dense opacity the size of a millet seed near the periphery in the right lower lobe, representing a calcified tubercle, and the root glands on the same side are stippled with calcareous deposit. There has been a primary infection in childhood easily overcome by "natural resistance," and we are confronted by the evidence of reinfection. What happened in that latent period of ten or fifteen years? What determined the apparently sudden reactivation of hibernating bacilli in late adolescence? If the reinfection, which gives rise to phthisis, is of endogenous origin—and the weight of evidence favours this hypothesis as explaining the origin of most of the cases we meet—the disease with which we are confronted is itself a late phenomenon.

Our problem may become simpler when infection becomes less prevalent, and in particular when the exposure of childhood to infection is no longer allowed. When a first infection with Koch's bacillus is postponed till adolescence or early adult life the latent period, due apparently to a peculiar power of resistance in the years preceding puberty, is shortened. The processes of infection, the transient manifestations of haematogenous dissemination—for example, erythema nodosum, pleural effusion, or "acute benign tuberculosis"—and the development of the localized disease we recognize as phthisis may be studied *seriatim*. Pathological processes are speeded up and, as in a Canti cancer film, intervals in which nothing appears to happen are obliterated. The young probationer exposed for the first time to tuberculous infection in the closed space of a hospital ward is found after a few weeks to have developed the allergic state. The Mantoux test, previously "negative," becomes strongly "positive." We might here claim to have discovered the early case. And if the demonstration of "allergy" is soon followed, as it may be, by evidence of overt disease, our claim would appear to have been justified. But the majority of infections of this type, whether occurring in a hospital ward or the African gold mine, where young recruits from up-country first meet with tubercle bacilli, are not followed by tuberculosis, benign or malign. Some are taken and the others left, and the choice appears to be capricious.

At the present time all we can hope to do is to detect the disease at a stage when the lung tissues show the first signs of disintegration. Early disease of this order can be diagnosed, and can, in most instances, be arrested. But early disease must not be taken to imply limited disease,

* A paper read before the Mid-Essex Division of the British Medical Association on November 1st, 1934.