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THE TREATMENT OF LUPUS VULGARIS*

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Lupus vulgaris does not belong to the common diseases. Stühmer thinks that in Germany the frequency of patients with lupus vulgaris (present or cured) is about 1 per 1,000 inhabitants. The incidence is much the same in Denmark, where from a population of about three millions we receive some 100 new cases each year.

The serious character of the disease is due to the following features: (1) its extremely chronic course—patients who have once contracted lupus hardly ever get rid of it without treatment; (2) the fact that it attacks young persons, spoiling the years of their youth and marking them for the rest of their life; and (3) its localization, in a great majority of cases, to the face, where it produces permanent and markedly disfiguring destruction of tissues, often so extensive that even if the disease itself is cured the tracks it leaves behind are so unsightly as considerably to handicap the patient in obtaining employment.

General Features of the Disease

Lupus, as is well known, may arise in three different ways. (1) By direct inoculation, which is rare and only of slight practical significance, as the lesions produced in this way are generally small, benign, and most often localized to the hands, where they are comparatively easy to cure. (2) By extension, as a rule in one of the following three ways: (a) from suppurating lymphadenitis involving the skin, most often from cervical or pre-auricular lymph glands; (b) from colliquative tuberculosis involving the skin—this is seen most often in children; and (c) around a tuberculous fistula—for example, tuberculous osteitis, arthritis, etc. (3) By haematogenous (or lymphogenous) transplants from tuberculous foci elsewhere in the body (lungs, lymph glands, or mucous membrane of the nose); this latter is by far the most prevalent.

From these facts it obviously follows that the most rational procedure for the prevention of lupus is to combat the spread of tuberculosis as a whole. To this end main stress should be laid on reduction of the number of infection-carrying persons rather than on the treatment of the individual tuberculous patients. It is not persons infected with a clinically serious form of tuberculosis—for example, pulmonary tuberculosis—who develop lupus; on the contrary, these patients seem to be fairly immune.

On going through the data in respect of all new lupus patients admitted to the Finsen Institute during the decade of 1922-31, we have found that out of a total of 757 patients (224 men, 533 women) only twenty-six showed signs of active tuberculosis. Among the remainder, fifty-five showed signs of old tuberculosis,

eighteen others showed areas of calcification in the hilar glands only, forty-five gave a past history of pleurisy, and a good many (250) had had cervical adenitis. It should be mentioned, however, that *x*-ray examination has not been made systematically, but only in a comparatively small number of cases, where there was particular reason for doing so. Consequently, it may be that latent tuberculous processes giving no symptoms have been overlooked in a considerable number of cases, though there cannot have been missed many cases of florid phthisis, as nearly all patients were under the closest observation in the hospital.

Prophylaxis.—Tuberculosis prophylaxis has two aspects—human tuberculosis and bovine tuberculosis. In pulmonary tuberculosis 97 per cent. of the cases are due to the human type of tubercle bacilli, and here the prophylactic measures must be isolation and treatment of open infectious cases. In tuberculous adenitis, which in about 80 per cent. of the cases are due to bovine infection, the prophylactic measures must be directed especially at milk control.

As to the aetiology of lupus vulgaris, our investigations at the Institute have demonstrated the infection to be bovine in about 40 per cent. of the cases. Dr. K. A. Jensen of the State Serum Institute, Copenhagen, has been kind enough to type-determine the tubercle bacilli in thirty-one cases of lupus vulgaris. Eighteen showed the human type, twelve the bovine type, and one a dysgonic human type. A particularly striking feature in these findings was the fact that a majority of the isolated strains—twenty-one—showed more or less attenuation of the virulence (ten human, ten bovine, one dysgonic human), whereas only five were found to be of normal virulence (three human, two bovine). In the remaining five strains, all human, the virulence has not yet been determined.

We have not been able to demonstrate any difference between the course of cases of lupus due to infection with the human type and cases due to bovine infection. In combating lupus it is essential, therefore, to have in mind both forms of tuberculosis. It would take too long to enter into the details of this prophylactic work, especially as this work falls largely within the domain of the chest specialist, school medical officer, and district medical officer. It will suffice here to establish that *the occurrence of lupus will be automatically reduced to the same extent as tuberculosis in general is reduced.*

Light Treatment.—So much for the prophylaxis. Fortunately therapy also enables us to do a great deal in the fight against lupus. In Denmark we estimate that we are able to cure about 80 per cent. of our patients—that is, make them free from symptoms—and to do that so thoroughly that they remain symptom-free for the rest of life, or at any rate for a number of years (*vide* the statistics of A. Reyn: *Comptes rendus du VIII Congrès international de Dermatologie*, Copenhagen, [3841]

* Read in opening a discussion in the Section of Dermatology at the Annual Meeting of the British Medical Association, Bournemouth, 1934.

1930). Our principal treatment consists in local Finsen treatment with concentrated carbon arc light, supplemented with carbon-arc-light baths. It is a very rare event for a case of lupus to be of so malignant a nature that it is not improved by our light therapy. During thirteen years' experience in the Finsen Institute, Copenhagen, the writer has only seen two such cases. Both were in children; the disease began in the nose and spread steadily in spite of thorough treatment. Lately, however, a new form of light treatment has been introduced, and it seems to be able to check the disease even in these two cases. Generally lupus is very amenable to Finsen light treatment, recovery being obtained in the great majority of the cases, and a considerable improvement in the remainder. In early cases with small lesions the percentage of recovery is practically 100. Consequently all efforts must be made to bring the patients under light treatment early in the disease, especially as a temporary symptomatic treatment (corrosives, cauterization, etc.), such as is often given by physicians anxious to render immediate help, may make light treatment difficult because the scars formed hinder the penetration of the light.

To ensure that patients come early under the Finsen light method of treatment it is essential to provide sufficient adequately equipped hospitals for such treatment. In Denmark, with its three million inhabitants, the Finsen Light Institute has been found to afford ample accommodation. It has for this special purpose about fifty beds, twelve lamps of the Finsen-Lomholt type, and a similar number of carbon-arc-light baths—that is, six light baths for the daily treatment of about sixty patients for one hour each. The Institute can receive nearly all the fresh cases of lupus referred to it, can carry on the treatment to relative recovery, and can also manage the treatment of a not inconsiderable number of older patients whose earlier treatment has not resulted in complete recovery. We have been able to cure several of these latter patients as well, and in the rest we have obtained a definite improvement.

Working of "Light Stations."—Assuming that the frequency of lupus vulgaris is relatively the same in Great Britain as in Denmark, Britain would require about ten stations of a similar size to the Finsen Institute to combat the disease effectively. In the establishment of stations for treatment of lupus it is an indispensable condition that each station must have as medical superintendent an experienced and interested *dermatologist* to manage the treatment, and, in addition, a capable *rhinologist* to assist him. It is also important that the individual stations should not be too small. Each station should be large enough to collect sufficient clinical experience to ensure that in it diagnosis and treatment may be efficient.

The therapeutic results achieved by these stations provide the best incentive to lupus patients to present themselves for treatment. For reasons not altogether accountable, most—or nearly all—lupus patients belong to the poor classes, and they are apt to lose courage if the first treatment to which they submit themselves does not give definite results. With their disfigured features they are so reserved that they do not even reappear in the clinic; but, with the better prospects of cure offered by the light treatment, they come so freely that it may even be necessary to select the cases most suitable for treatment—that is, cases in which there are prospects of complete recovery. It may even be necessary temporarily to turn away cases with particularly extensive lesions (mostly elderly persons) because they would require too much time and occupy the apparatus too long in relation to the possible result obtainable, and so hinder the treatment of younger patients with less extensive lesions.

The close co-operation of the general practitioner and dermatologist is of great importance to the success of the work of the stations. In instruction of dermatology at the medical school particular stress ought to be laid on the mention of lupus vulgaris. Lupus vulgaris, like tertiary syphilis, is a disease that is very frequently wrongly diagnosed, especially in its earlier stages, when the treatment is easy and gives most promise. It must be impressed upon the medical students that in dealing with any protracted stationary affection of the face they must always keep in mind the possibility of this disease, and, in case of the least suspicion, apply to an experienced colleague for assistance in diagnosis and treatment. As mentioned before, lupus is particularly frequent in the poorest classes of the population, perhaps partly because the disfiguring disease precludes these unfortunate persons from all chance of employment. The lupus stations must therefore co-operate with the physicians attached to institutions for the poor and disabled, with the medical district officers, with school medical officers and physicians attached to institutions for the care of children suffering from surgical tuberculosis. Lupus is of rare occurrence in sanatoria for adults with pulmonary tuberculosis. It is also important to arouse the interest of nurses engaged in charity work, municipal nursing, tuberculosis stations, etc. Most lupus patients have no regular family physician to consult, neither do they belong to sick benefit clubs, and the charity nurses should be the best informed as to the existence of chronic lupus patients in need of treatment.

There are two forms of treatment—general and local—and our experience shows that the local treatment is still the most efficient of the two, although the general treatment is also of importance.

General Treatment

1. *Dietetic Measures.*—In recent years, particularly in Germany, extensive experiments have been made with certain forms of diet (Gerson, Hermannsdorffer-Sauerbrück) which contain a large amount of vitamins and fresh vegetables, and practically no sodium chloride at all. Some authors have reported very good symptomatic results from this treatment, although real cure appears to be considerably less frequent. The results reported by other authors have been more modest.

In the Finsen Institute, experimental treatment with this diet was given to forty patients, but without any noticeable effect. When the patients themselves were asked what was their personal impression only one replied that he had noticed any considerable improvement. Six thought there was some improvement, but the rest had noticed no change at all, or at the most only a very slight improvement. It is difficult to give any explanation of this, but possibly it is connected with the diet of the patients prior to their admission for dietetic treatment. Often the food of poor people is very monotonous, and it is particularly poor in green vegetables and vitamins, the importance of which for the resistance of the organism to infections has been demonstrated clearly in recent years. It is easy to understand that the condition of such patients improves when they are placed on a more suitable diet, but this does not warrant the diet being regarded as a specific remedy against tuberculosis, or assuming that a change in diet would be sufficient to effect complete recovery.

In view of these experiences, however, we have in recent years given many of our patients supplementary food rich in vitamins in addition to the ordinary diet—particularly in cases with extensive processes of lupus vulgaris, where the general condition of the patient was debilitated. This supplementary vitamin food consisted of vitamin A (50 grams butter and two carrots), vitamins

B and E (two tablespoonfuls of wheat germ), and vitamin C (the juice of a lemon). With this diet we have obtained a considerably greater increase of weight in our patients than usual (about double).

2. *Light Baths*.—Finsen was the first to observe that sun baths had an excellent effect on surgical tuberculosis. Unfortunately the climate in Denmark does not permit of an extensive treatment with sun baths, but the idea rapidly gained ground in other countries, especially in Switzerland (Bernhard, Rollier), where it gave excellent results. Later Reyn introduced a similar treatment with artificial light: the Finsen carbon-arc-light bath, given as a supplement to the classical local Finsen treatment of lupus with concentrated carbon arc light. By this the therapeutic results in the Finsen Institute were improved considerably, and this combination of local and universal light treatment still remains the routine treatment in our Institute. It is our experience that the carbon arc light has a much stronger effect on lupus vulgaris than the mercury lamp. In recent years we have commenced to introduce a new type of lamp, the "universol lamp" in which the pure carbons are replaced by Siemens's Schneeweisskohlen ("white flame carbons"), which give an emission resembling sunlight considerably more closely than does the emission from pure carbons. The carbons are placed almost parallel, so that the emission from both craters is utilized when the patients are irradiated in a horizontal position with the lamp suspended above them. With this lamp we obtain a much stronger erythema effect than previously, and the same, or even a better, therapeutic effect with a shorter time of exposure. Of course it is difficult to furnish any statistical proof of this, but several patients in whom the improvement seemed to have stopped under the original carbon-arc-light treatment made new progress with the new light baths. This was the case with the two before-mentioned cases which, as stated, proved refractory to the original treatment with the Finsen light bath.

The light baths are to be given to the patients lying down, daily or every other day, in such initial doses as will produce a moderate erythema. The time of exposure is increased gradually from day to day, up to one hour as a maximum, care being taken to avoid a strong erythema uncomfortable to the patient. In case of strong irritation it is advisable to make a short pause, and then begin anew with a smaller dose. The treatment should not be continued uninterruptedly for more than three months at the most, after which period there should be a pause for about one month. Then the light baths may be given again. We have never seen any injurious effects from our light baths, and this applies also to patients suffering from a simultaneous pulmonary tuberculosis. In pulmonary cases, however, greater caution is advisable so as to avoid any exhaustion of the patients by a too energetic treatment. In favourable cases complete recovery of lupus may be obtained by treatment with carbon-arc-light baths alone, as has been demonstrated previously by Heiberg and With. Not long ago I had occasion myself to make sure of this in one case, in a Swedish patient with an enormous plaque of lupus vulgaris on the face and numerous smaller lupus nodules on the legs—so many that it would have taken much too long a time to give local treatment. The lupus processes on the legs subsided almost completely under the light bath treatment. Subsequent histological examination of two small lupus lesions showed no sign of tuberculous granulation tissue.

Local Treatment

Local treatment is still the most important form of therapy, and comprises several highly effective methods.

1. *Surgical Removal*.—Excision is the most sure and, if successful, the simplest method. It may be employed for very small lupus lesions on the face—though not very well where a lesion is located on the nose—and on the hands, and against most lupus processes on the trunk and extremities. The excision must include also a surrounding zone of definitely normal tissue. The result will most often be complete recovery, although recurrence is not altogether rare. To ensure a neat scar formation, and particularly when there is a tendency to hypertrophy of the scar, we give the patient an after-treatment with radium emanation of about 0.04 millicuries per square centimetre, applied in thin wax plates for a period of about sixteen hours at a time, and altogether four or five times at intervals of four weeks. Simple removal of the lupus process by scraping with a curette never leads to recovery, and should therefore never be resorted to.

2. *Electrocoagulation*.—In recent years this treatment has been largely recommended, especially by German authors. It has the advantage that the risk of recurrence is less than with a simple excision; on the other hand, the scars are not quite so neat after electrocoagulation as after excision. The treatment may be carried out either by compact destruction of the entire area involved—the method of choice with all small lesions—or by regular excision with a knife-shaped electrode or a bent band-shaped electrode, as recommended by Wucherpfennig (*Über das elektrische Schneiden mit der Drahtschlinge*, Jena, 1932). The open wounds are allowed to fill in by granulation, or their edges are pulled together by sutures. This method is quick and radical, and often gives fairly good results, but it must be clear that it is not an ideal method, as it often produces disfiguring scars. We have therefore refrained from its employment in most recent cases. In these we always prefer the light. On the other hand, we employ electrocoagulation a great deal in small local relapses in light-treated tissue that are found resistant to repeated treatment with light. After removal of the lupus lesion with electrocoagulation we often repeat the light treatment, and we have had quite satisfactory results from this combination.

3. *Scarification*.—This form of treatment has been recommended, especially by French authors. We have had no personal experience with this method in our Institute, but it does not appear to be very effective.

4. *Chemical Corrosion*.—The sovereign caustic for this purpose is pyrogalllic acid, which Veiel proved to have an elective caustic effect on tuberculous granulation tissue. It is most efficacious when combined with salicylic acid and resorcin (vaseline, 11 parts; pyrogalllic acid, 3; salicylic acid, 3; and resorcin, 3). This is a very powerful caustic ointment, but a satisfactory effect may be obtained also with somewhat weaker concentrations.

The procedure is as follows. The ointment is smeared on a piece of lint cut to fit the plaque to be treated and fastened by a tight bandage. The bandage is changed in the morning and in the evening, and each time as much of the destroyed tissue as possible is cautiously removed. The treatment may be rather painful, and as a rule is only tolerated for a few days at a time. When the treatment is discontinued the caustic ointment is replaced by an indifferent soft ointment, or by a compress of 0.2 per cent. resorcin solution.

Corrosive treatment is able to remove the main part of lupus tissue, even in large plaques, but complete recovery is rare. After some time new nodules make their appearance in the zone around the scar and in the scar itself. Further, the scar is apt to undergo hypertrophy and become rather disfiguring. A serious drawback to the corrosive treatment is that the massive scar tissue makes subsequent light treatment very difficult. If there is

any chance of having the patients treated with light one should not waste any time on a protracted corrosive treatment under which there may be heavy scar formation. On the other hand, pyrogallol ointment may be employed with great advantage as a preliminary to light treatment in cases with extensive proliferating lupus plaques, removing rapidly and readily the main bulk of lupus tissue. But the local Finsen treatment should always be instituted immediately after. Corrosive treatment is indispensable in dealing with the verrucous form of lupus on the hands, being excellent for removal of the keratotic surface of the lesion, which it is hard for the light to penetrate.

In England much use is made of a special remedy—liquor hydrargyri nitratis acidi, *B.P.*, 1914. The solution is applied cautiously to the individual lupus nodules by means of a small cotton swab, and it is left on for a few minutes so that it produces a local corrosion. We have not had any personal experience with this treatment in lupus, but we employ the same remedy largely in the treatment of tuberculous abscesses and fistulas. In these conditions it is highly efficacious, superior to all other remedies.

5. Local Light Treatment.—There are two methods for local light treatment. The Finsen treatment with concentrated carbon arc light, and the Kromayer treatment with water-cooled mercury vapour light. The latter method of treatment is by far the easier and less expensive, but it is the general consensus of opinion that it is considerably inferior to the Finsen treatment, and therefore it ought to be employed only where Finsen treatment is not available.

For Finsen treatment, as carried out at the Finsen Institute, we now use exclusively our new model of the Finsen-Lomholt lamp, which has the advantage of being worked automatically, so that one nurse can operate three lamps at a time. This lamp, also, is considerably more effective than the original model. Its main points are as follows (for details see *British Journal of Dermatology*, 1930).

I. A carbon arc lamp of 20 to 30 amperes, with automatic regulation, and with the positive upper carbon in the horizontal and the negative carbon in the vertical position.

II. A concentration apparatus consisting of: (1) a strong plano-convex front lens (focus distance about 10 cm.); (2) a large quartz cylinder, the ends of which are formed by two plano-convex lenses melted into the walls of the cylinder, the cylinder being filled with a watery solution of cobalt sulphate (red); and (3) a cuvette filled with a blue solution of copper sulphate in strong ammonia, a strong plano-convex quartz lens forming the front side of the cuvette.

III. A number of quartz tubes of different shapes, to be used for the compression of the lupus patch during the treatment.

By using lenses of thermo-resistant quartz (fused instead of natural silica) it is practicable to place the luminous positive crater close to the concentration apparatus, and the use of coloured filters makes it possible at the same time to filter off the inactive luminous rays. By this the concentration of the ultra-violet rays is increased to four or five times the concentration obtained with the original apparatus, so that the irradiation time may be reduced to about one-third of the time formerly required. Thus one nurse can easily treat nine patients in the same time that it previously took to treat a single patient. This naturally means a saving of time and money, and, in addition, the effect is stronger and more constant. Using carbon with a nickel core, a greater therapeutic effect is obtained, because it gives a considerably stronger emission in that part of the ultra-violet field which appears to be of particular importance for this therapeutic effect. This is in the field from 3,300 to 3,600 A.U. It is essential to clean the lupus lesion very carefully and cautiously before the treatment, removing all scales, crusts, and remnants of ointment, but avoiding any

bleeding. A front piece is chosen which corresponds in size and form to the lupus area which is to be irradiated, but the treatment must always include also a zone (about 5 mm. wide) of the adjacent healthy tissue. The compression apparatus is adjusted to give a firm, fairly strong pressure, so as to cause an effective degree of anaemia in the area in question. Experiments on rabbits' ears have shown that this is essential in order to obtain a good deep effect. Yet the treatment need never be painful to the patient, and ought not to be so. Only in rare cases with extensive open lesions may it be necessary to employ some local anaesthetic (2 to 4 per cent. cocaine or percaïne solution).

The treatment must be given in an orderly manner, beginning at one side of the lesion and proceeding systematically until the whole plaque is treated completely. The physician in charge must follow the treatment from day to day, and direct what parts are to be treated and in what succession; he must watch especially that one application joins another closely, so that no diseased tissue is missed. As a rule the nose is the first area to be treated, beginning with the vestibule when this is involved, as the treatment of this part will be painful if sensitive reactions are already brought about on the outside of the nose by preceding treatment. Similar rules apply to treatment of the inner surface of the lips. It goes without saying that the treatment of these parts should be carried out in co-operation with the rhino-laryngologist. In the case of an extensive lupus plaque involving both halves of the face the treatment must be managed so that the patient is able to rest comfortably on one side at night. A lasting good result can be obtained without pain. On the other hand, it is only natural, for the patient's own sake, to make the treatment as intensive as possible. Occasionally it is advisable to cut down the irradiation time to three-quarters or half an hour—for instance, when the lesion is very extensive, or when the patient has been treated previously with x rays, after which the skin reaction is always particularly strong and painful, and slow in healing.

The power of the current should as a rule be kept steadily at about 25 to 30 amperes. With this there are no difficulties with the usual front pieces. It happens now and then, however, that the patient complains of secondary pains from the reaction set up by the treatment in the large open plaques. If very intensive treatment is essential, such pains are unavoidable. These pains are never very severe, though they may weary the patient by being so protracted, but as a rule careful bandaging will reduce them to a minimum. The great majority of our patients do not complain of pain at all.

Results of Light Treatment

To obtain rapid healing it is very important strictly to carry through a suitable treatment for the reactions that appear after irradiation. They heal fairly rapidly—in eight to fourteen days—when treated with moist compresses—for example, 0.2 per cent. resorcin solution. The compress consists of three to four layers of lint, cut exactly to the shape of the inflamed area, soaked with the solution, and wrung so hard that they remain only a little moist; they are then covered with waterproof material or with a piece of lint smeared with ointment. The dressing is changed at least three times daily. If it is not practicable to change the dressing so often it will be preferable to apply an ointment bandage—for example, vaseline 40 parts, adip. lanae hydrat. 50, zinc. oxid. 10. In secondary infection an antiseptic—for example, precipitate of mercury 2 per cent.—is added. Silver nitrate is not to be used on account of the colour, neither in solution nor for ointment. Occasionally it

may be advantageous to use compress bandage and ointment bandage alternately, or to change from one to the other, according to what is most agreeable to the patient. In only quite exceptional cases will it be necessary to employ a local anaesthetic (cocaine, percaïne).

If the lupus plaque is ulcerated to begin with the ulcerated places must be treated directly. If the irradiation produces distinct haemorrhage the treatment of this area must be discontinued until the blood has been absorbed, as free blood in the tissue cannot be made to disappear by compression, and the ultra-violet rays are absorbed by haemoglobin. As a rule the treatment may be repeated after one to two weeks. *In lupus of recent development our rule is always to give five to seven series of irradiations with an interval of eight to fourteen days as first treatment.* Each series consists of a number of exposures lasting one hour and covering an area the size of, say, a shilling, until the whole patch has been irradiated. This will in most cases give complete recovery. In several cases we have seen healing after only three to four irradiations, but as it is exceedingly important to obtain complete recovery with the first treatment, five to seven treatments should be the normal. In the case of compact processes in which the lupus granulation tissue is particularly refractory to treatment, more applications are required. Relapses are more difficult to cure, because the rays have to pass through the scars formed after the previous affection and by the light treatment given.

It cannot be emphasized strongly enough how important it is to complete the treatment the first time. In most of the cases in which we have obtained a lasting cure recovery was obtained with the first treatment. The consequence of this is that in circumstances where a sufficient number of apparatuses are not available, the suitable cases must be carefully selected and treated thoroughly and completely before others are taken on. It is the worst economy imaginable to institute treatment on many cases which can be only half carried through, so that one has to fight in the following years with troublesome and persistent relapses. It is costly and burdensome both to doctor and to patient.

The Finsen treatment may very well be carried through on out-patients. It is advisable, however, if possible, to admit to hospital patients with extensive lesions, especially if their general condition is poor. Only in a hospital is it practicable to ensure a perfectly effective treatment of such patients, for it is difficult to have large areas of light reactions treated properly outside the hospital. Where less extensive lesions require general treatment, such, for instance, as light baths, the patients should be admitted to hospital unless they live so near to the clinic that they can easily attend for treatment every day or every other day. In cases of small benign lesions, where the chief requirement is local treatment, it is best to admit the patients to the clinic for one or two days at intervals of two to three weeks. It is fortunately not essential that a lupus patient should be treated in an extensively equipped modern hospital, as only few lupus patients suffer from severe progressive tuberculosis. For rational and effective combating of lupus vulgaris it is of the very greatest importance that the patients should, through energetic propaganda, be made to apply for treatment in the very earliest stage of the disease, and should afterwards be kept steadily under close observation by re-examination two or three times a year, so that any relapse that may appear can be treated effectively at once.

Treatment of Lupus of Mucous Membrane

With the original treatment of lupus vulgaris the most difficult point was undoubtedly the treatment of

lesions of the vestibule of the nose. This frequent localization, which is often the starting-point of relapses on the outside of the soft part of the nose, was previously treated by means of a quartz prism, constructed by K. K. Lundsgaard, through which the light was reflected on to the mucous membrane. But the effect of this treatment was often uncertain, because it was difficult to fix the prism apparatus in the proper position. Furthermore, the effect was always very weak, because the effective utilization of the rays was only slight—10 per cent. maximum. Even with an uninterrupted radiation lasting four hours the reaction was often quite weak.

The new apparatus produced much better results from this part of the treatment. The front piece to be used for the treatment of the vestibules is somewhat longer and more pointed than the forms used for skin treatment. The little surface which is to lie on the lesion is made oblique, and this gives an apparatus which may be introduced into the vestibule quite easily, and is readily adjusted to the surface of the mucous membrane by firm pressure on the outside of the nose, easily maintained by the patient himself during the treatment. With the new apparatus the intensity of the radiation was multiplied. It is possible within fifteen to twenty minutes to get a constant and much stronger effect than could be obtained previously in four hours. The vestibular lupus was previously extremely difficult to cure, but now the cure is always easy.

A longer and more slender model was constructed for use in the depth of the oral cavity, and even on the posterior wall of the fauces, but this required a modification of the concentration apparatus in order to obtain a longer focal distance. Through intimate co-operation with the oto-rhinologist of our Institute, Dr. Ove Strandberg, we have been able in the last year to treat some cases of lupus of the gums and fauces—some of them very extensive lesions—and we have obtained a considerable improvement, even clinical recovery, in cases which had previously been intractable.

The above-mentioned front pieces are also very serviceable in the treatment of lupus of the inner surface of the eyelids. Here, of course, it is essential to protect the cornea carefully from the light rays, and a very simple way of doing this is to wrap the front piece in several layers of gutta-percha paper.

Radium and X-Ray Treatment

Radium and x rays have been widely used in the treatment of lupus vulgaris. They give a good transitory, symptomatic effect on the patch, but a definite cure is rare, and the result will after some years generally become that of a disfiguring atrophy with the well-known telangiectasia, irregular pigmentation, and even ulceration; not to mention the marked tendency to malignant degeneration. Very unfortunate is the difficulty created by this atrophy and reduced vitality of the skin for the treating of relapses of lupus vulgaris in the atrophic scar with light. The treatment becomes very painful, and the reactions after the light treatment heal but slowly—in months instead of weeks. The new Grenzstrahlen seem less dangerous than radium and x rays, but a definite cure seems by their means equally difficult to obtain.

Conclusion

According to the scheme outlined above we have treated about 150 fresh cases of lupus vulgaris in the Finsen Institute, Copenhagen, during the last two years. Apart from a few extensive inveterate cases in patients who could not afford sufficient time for proper treatment, we have obtained apparent cure in nearly 80 per cent.—that is, all nodules and other symptoms of activity disappeared,

and the scars remained free from relapses. In the rest of the cases great improvement was obtained. Only a few scattered nodules reappeared in a scar otherwise free from lupus. Probably a repetition of the light treatment, combined perhaps with electrocoagulation, will succeed in removing in these cases, too, the last remnant of the disease, as was in fact found with a number of other inveterate cases which had proved refractory to previous treatment with the original Finsen apparatus.

The two outstanding advantages of the Finsen treatment are its efficacy, and even more the ideal cosmetic results: soft, smooth, often hardly visible scars, which have preserved the full vitality and resistance of the natural skin without any disposition to atrophy, ulceration, or malignant degeneration.

THE EYES AS A CAUSE OF HEADACHE*

BY

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It is surprising to an ophthalmologist that physicians attach relatively so little importance to the eyes as a cause of headache. I have examined my notes of 1,000 private cases, and I find that 24 per cent. of the patients came to me complaining of headache. Not every headache, however, is due to use of the eyes, and the oculist, faced with a patient complaining of headache, must determine, if he can, whether the headache is an ocular one or not. In this he may be greatly helped by the history which he obtains from the patient.

First, as to the *situation* of the pain. Usually an ocular headache is frontal or orbital ("pain behind the eyes"); more rarely is it occipital or temporal, and almost never is it vertical. In the series of cases which I analysed, of 181 cases where the type of headache was noted 60 per cent. were frontal or orbital. Next the *time of onset* of the pain should be ascertained. Commonly with ocular headache the pain comes on in the late afternoon or early evening—that is, at the end of a day's work. Sometimes a headache is present on waking in the morning, and it may be difficult to persuade the patient that this morning headache has been earned by misuse of the eyes on the preceding day. Of course, other headaches may be earned overnight, such as that which comes out of a whisky bottle, but the patient always recognizes this type, and will say that if he ever gets a headache he knows to what to attribute it.

The delayed headache is probably due to the power of the healthy human being to ignore slight pain. It is only when he is tired, or when his control has been weakened by sleep, that he becomes conscious of pain. Sometimes patients will say that if, for any reason, they wake in the night, they find they have a headache. Another instance of delayed pain is the week-end headache; the patient may be free from pain during the week, but on Sunday, although using his eyes less, he gets headache. One patient said that he had not time for a headache during the week. Association of the pain with use of the eyes may be so clear as to make it reasonably certain that we are dealing with ocular headache.

Ciliary Muscle Contraction as Cause of Headache

Although the pain of eye headache may radiate through any of the branches of the trigeminal nerve, the initial

cause is painful contraction of muscle. The muscles concerned may be the ciliary muscles, the extrinsic eye muscles, or the occipito-frontalis. If one doubts that contraction of the ciliary muscle can be painful one should put strong eserine drops into an eye; the resulting pain may be severe enough to cause nausea.

The simplest case of pain from ciliary muscle contraction is that of a hypermetrope with equal errors in the two eyes. Such a patient can only see clearly by contracting the ciliary muscles, and throughout his waking day they are in a state of tonic contraction, the contraction being greater when close work is done. After prolonged close work these muscles tire, and the patient finds his sight varying, the type appearing alternately clear and confused. He may seek relief from this by stopping his work and gazing into the distance for some minutes, when he finds that he can continue to focus his work for a time. More frequently he discovers that by getting closer to his work, and so obtaining larger retinal images, he can appreciate it, in spite of confusion of vision, with less mental effort, but this diminution of mental effort is gained at the expense of accommodation and convergence, and a vicious circle is set up, which ends in headache or in breakdown of accommodation. Most children are guilty of the mental laziness which makes them read at too short a distance and so gain larger retinal images. The habit is accentuated by refraction errors and by imperfect lighting, and is one which should be combated constantly by teachers and parents.

When the hypermetropia is of different degrees in the two eyes the ciliary muscles are presented with a more difficult task. Not only must the patient accommodate in order to see clearly, but he must accommodate to a different extent in the two eyes. Patients will often tolerate a considerable under-correction of their hypermetropia or presbyopia better than a small imbalance of accommodative effort in the two eyes. In correcting refraction errors it is of the greatest importance to get the two eyes balancing in this respect.

In astigmatism there is introduced another abnormality of ciliary muscle contraction. If there is much astigmatism the ciliary muscle may make little or no effort to correct it, and there is no "eye-strain" and no headache. But if the degree of astigmatism is low or moderate the ciliary muscle contracts irregularly, more in some fibres than in those at right angles to them, and produces a lental astigmatism of opposite sense to the corneal astigmatism. Often enough the effort is overdone, and we find that a patient who, for instance, has a low degree of astigmatism "with the rule," chooses a cylinder "against the rule." Low degrees of astigmatism often cause more severe headache than do high degrees, although the importance of correcting very small refraction errors has been exaggerated.

More debatable is the question of "eye-strain" and headache being caused by contraction of the iris muscles. It is undoubted that the early cinema theatres were more productive of "cinema headache" than are the modern ones. Much of the improvement may be attributed to abolition of flicker and to reduction in the size of the screen, but another factor is that, whereas in modern cinema theatres a certain amount of general illumination is kept, in the old theatres the house was quite dark. Alternate gazing at the brilliantly lit screen and into surrounding blackness caused alternate contraction and dilatation of the pupils, and this may well have contributed to "cinema headache." In some of the newest cinemas the audience must traverse long corridors before reaching the theatre. One may be inclined to attribute this to love of display on the part of the management, or to ineptitude on the part of the architect, unless one observes that the illumination is gradually reduced as

* Read in opening a discussion in the Section of Ophthalmology at the Annual Meeting of the British Medical Association, Bournemouth, 1934.