how far this statement is one of fact is a question which it is not proposed to examine further than to suggest that it may be possible that, owing to the constant absorption of toxic products, the various neurasthenic features may be due to the direct effect of these absorbed toxins on the central cerebro-spinal system, and if this is so it would seem obvious that any measure which quickly and thoroughly cleans the colon of its harmful products must be the most desirable.

Without discussing the various treatments by means of lavage, diet, waters, exercises, and intestinal antiseptics which are carried out in this country, at Plombières, and elsewhere, with marked success in many cases, there remain a large number of cases which, either from neglect or in spite of treatment, are in a miserable condition of chronic ill-health, which no amount of treatment can do much to alleviate. It is for such cases that I would suggest a much earlier resort to surgery. It does not appear to be possible to clear the colon of its contents by the ordinary methods of lavage; besides which the process, if carried out effectively, is distinctly an exhausting affair, especially having regard to the enfeebled state of the individual concerned. When once the operation of appendicostomy has been performed the process of washing out the colon is one which is easily carried out with the smallest amount of discomfort to the patient, and with a rapid disappearance of the amount of membrane and great amelioration of the symptoms, such as pain, flatulence, etc. The constipation is not so easily overcome, but there is distinct improvement in this respect, and the appetite is greatly improved, the weight increases, and with the improved physique the recuperative powers are increased, and with a continuance of the treatment, with due regard to diet, and with as perfect hygienic surroundings as possible, there is no reason why these people should not get well; but the treatment may take many months—even a year—before the patient is able to discontinue it and allow the opening to close.

In some—nay, in most—cases the patients bear the treatment with equanimity because of the greatly increased comfort they derive from it.

There is not any necessity for these people to stay in hospitals or nursing homes longer than two or three weeks, as for the purpose of carrying out the treatment the patient can soon learn to do this with any slight help from some member of the family or a servant.

Perhaps the most important thing in diagnosis in reference to treatment is the early examination by the sigmoidoscope.

There is no doubt that much may be learned from such an examination and a great deal of time saved, and I would strongly urge that this should be done quite early. The state of the bowel wall can be made out and specimens of pus or secretion can be obtained for microscopical examination or for bacterial investigation; the extent and depth of any ulceration can be made out and the question of any growth can be settled. With the sigmoidoscope for diagnosis and the various surgical methods which have been described much can now be done to relieve the various forms of colitis. The important question is whether these surgical measures should not be resorted to much earlier and more frequently than is now the custom.

THE University of Leipzig will celebrate the 500th anniversary of its foundation in August, 1909.

THE will of the late Dame Frances Russell Reynolds directs that a sum of £1,000 shall be paid to the National Hospital for the Paralyzed and Epileptic for the maintenance of a bed in memory of her husband, the late Sir Russell Reynolds.

It is apparent from a paper read by Mr. Berry at the Scottish Institute of Brewing on "The Condition and Head on Beer," that the public demand for a beer with an attractive "head" is more exacting than it was some years ago. In consequence, many brewers now resorted to carbonating beers. In the days of the East India pale ale, when much higher alcoholic beers were in vogue, the production of an attractive and lasting "head" did not present the same difficulties as the present day. Science has now come to the aid of the brewer, and by careful and judicious malting, methods could be employed that would produce, even on low alcoholic beers, a head and conditions of surpassing attractiveness.

THE TREATMENT OF CHRONIC RHEUMATIC AND RHEUMATOID ARTHRITIS BY RADIANT HEAT AND CATAPHORESIS.

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It appears reasonable in the present state of knowledge of the pathology of the conditions included under the terms "chronic rheumatic arthritis" and "rheumatoid arthritis" to accept, for purposes of treatment, the view that they are inflammatory affections of a progressive character, probably caused by toxins elaborated by micro organisms; also, that the micro-organisms or micro-organism in question may have their habitat in the joints affected, or may dwell elsewhere (perhaps in the naso-pharynx, perhaps in some portion of the alimentary tract); also, that circumstances which depress the general or local circulation, allowing the blood to more or less stagnate in the structures which form the joints (and the circulation is normally comparatively slow in these structures), act as strong predisposing causes; that, of these depressing circumstances, one of the most important is continued exposure to cold and wet, or both combined, others are insufficient nutrition and mental shock; and that another predisposing cause may be repeated slight traumatism, for it always appears from the history that the joints which have been exposed to the greatest wear and tear are usually the first to succumb.

Unless we start with some such definite, although perhaps hypothetical, view of the pathology of the affections, treatment tends to be empirical. Assuming, therefore, that the above microbic theory is correct, the value of improving nutrition by generous diet, cod-liver oil, and fats is manifest, as also the prescription of drugs empirically found to produce a good effect—and all being more or less antibacterial, such as iodides, arsenic, quinine, and guaiacol—and more especially the removal of our patient from the influence of the predisposing causes.

The comparative want of success in one portion of our treatment lies in the fact that, although we may give drugs as remedies in large doses and for long periods, yet the actual amount at any time of any drug circulating slowly in the joint tissues is in reality quite small, and, therefore, the beneficial effect is proportionate. To increase the latter the treatment by radiant heat and cataphoresis may assist us materially.

The action of heat in relieving pain and exerting some control in checking these diseases has always been recognized in chronic rheumatic and rheumatoid arthritis; local treatment has comprised hot poultices, compresses, volcanic-mud and moor-mud baths, vapour and hot sand baths, and so on, but the most efficacious of all heat applications is dry radiant heat. Until recently the radiant heat appliances supplied have usually been box-like, the distance of the radiant surface from the joint could not be regulated, and they were often covered in with asbestos sheeting, and thus imperfectly ventilated. In consequence we may have, combined with radiant heat, a condition to be avoided, namely, "moist air heat." They have a more important defect in that, as the radiant surfaces are made of ordinary low candle-power electric carbon filament lamps, they give out rays consisting almost solely of the yellow and yellow-orange. Now the ideal type of radiant heat should be as nearly as possible like sunlight and should give a spectrum ranging from the ultra-red to the ultra-violet. This type of spectrum can apparently be only obtained from lamps of very high candle-power. I am quite convinced that an absence of the violet and ultra-violet rays in the ordinary apparatus is largely responsible for the weakness of sedative effect and slow relief of pain, whereas absence of yellow-green rays may be responsible for only slight stimulation of metabolism.

I find a type of radiant heat apparatus, manufactured and largely used in America,* very satisfactory. It consists of a single large lamp in a funnel-shaped projector lined with a reflecting surface. The projector may be raised or lowered by a system of counter-weights, or

* Obtained for me by Mr. A. E. Dean.

turned in any direction with one hand; the rays can be directed easily and rapidly on any part, and the maximum amount of heat the patient can bear can be adjusted to a nicety. The lamp is very large, with a thick filament, requiring and using up as much current as twenty-four 32-c.p. ordinary lamps. Twenty-four 32-c.p. lamps give out altogether a light equal to 768 candles, consisting almost entirely of yellow and orange rays; the large lamp has a luminosity of only 500 candles; the remaining electric energy, equal to 268 candles, is used up in producing heat rays and the other rays of the spectrum, which, as I have said, are of the greatest value in therapeutic effect. With this apparatus a temperature of 400° F. is obtained, and, as it is a perfectly dry heat, can be endured with fair comfort and without damage to the skin. By the use of coloured glass screens, only red, yellow, or violet rays can, if desired, be used.

The general result of radiant heat exposure for any length of time is that the cutaneous and deeper vessels are dilated, the lymphatics are filled, the local arterial pressure is diminished, and local metabolic processes are increased.

The effects do not pass off at once, and after repeated exposures they become more or less permanent. Besides their influence on the tissues, the rays also exert an effect on micro-organisms, and in addition increase leucocytosis. Thus the condition of circulation and tissue-metabolism in a joint, during and after twenty minutes' exposure to intense radiant heat, is pathologically altogether different from its state before that exposure. The most noticeable result, to the patient, of this altered condition, as a rule, is a rapid total removal or extreme alleviation of pain; probably, the ultra-violet rays, by their anaesthetic action, may be to some extent responsible for this change.

The recent adoption of local ionization as a means of treatment of various diseases has suggested the immediate following up of radiant heat treatment by ionization or cataphoresis with an iodide or salicylate solution. It is an accepted fact that, when a constant current passes through any portion of the body from electrodes soaked with a 2 per cent. solution of any salt (such as lithium iodide or sodium salicylate, for instance), the basic radicle of the salt travels into the tissues from the positive electrode in a more or less direct line towards the negative electrode, whilst the acid radicle leaves the negative pole, enters the tissues, and travels towards the positive electrode in the same direct manner. The quantity of the basic or acid radicle entering is proportional to the current passing, and although the amount flowing in at any period may be comparatively small, yet, if a current of 2 milliamperes per square centimetre is continued for 20 minutes, using large electrodes or a bath of solution, the amount of lithium or iodine entering the tissues in a "nascent" and so very active state, is appreciable. It is probable also that the general migration of all kinds of ions, which takes place along the course of the current, may produce an effect of commotion in and stimulation of the tissues, which is beneficial.

The joints I have treated, as a rule, undergo twenty minutes' exposure to the radiant heat projector at such a distance (the patient often regulating this) that as much heat is applied as can be tolerated. During the sitting the patient moves the joint into different positions, turns it from side to side, and gently rubs the skin with the hand to allay the burning sensation, which passes off fairly rapidly, and is followed, as the heat penetrates the joint, by a sense of comfort and relief from pain, if previously present. When, at the end of twenty minutes, the lamp is switched off, the joint feels burning hot to the touch, and the surface is red and mottled from vascular dilatation.

Directly the radiant heat sitting terminates, cataphoresis with iodine "ions" immediately follows; in some cases, however, lithium "ions" seem more efficacious and are used instead. If a wrist is to be treated, it is immersed in an arm-bath containing 2 per cent. lithium iodide solution, and either a large indifferent pad is placed on the back or the other hand is immersed in another arm-bath, ammonium chloride or common salt solution being used for the indifferent pad or bath. If both wrists are affected, I generally ionize one wrist with iodine ions and the other with lithium ions, two arm-baths containing lithium iodide solutions being used, a wrist placed in each and the current

driven from one bath to the other. Where the knee is treated it is packed round with four thicknesses of lint soaked in lithium iodide solution; the lint is in turn surrounded with flexible copper gauze electrodes or by a copper chain-armour electrode; the foot is placed in a bath of sodium chloride solution, for the indifferent electrode. Where one uses baths for feet and hands, large carbon electrodes which are not acted upon by ions are the best, but for knees and elbows one has to use copper electrodes. Any other joint can be treated in a similar manner, but, naturally, the deeper the affected structure from the surface the less is the treatment applicable.

It is necessary to work with large currents; a battery is not suitable to maintain the constant current; one cannot obtain 30 to 70 milliamperes from a battery for long enough even when it is very large and cumbersome. A switch-board, worked from the town electric supply, is perfectly satisfactory, as it enables one to obtain and to regulate to a nicety the amount of current one requires and the patient can bear without pain.

I attach extreme importance to the continuance of drugs by the mouth during the combined treatment, and believe that much less benefit is derived if they are stopped. In my opinion, one great value of cataphoresis is that it causes acid or basic radicles, in a so-called "nascent" state, to be formed in the path of the flow of the constant electric current. Drugs such as iodine preparations or soluble guaiacol salts lying in or circulating through the joint tissues—should the patient have been taking them for some time and in fair quantities—are broken up by the current and locked up in the joint tissues temporarily, instead of being carried through the blood vessels and excreted. Besides, "nascent" ions generally are in all probability much more actively bactericidal and much more energetic than when they combine into soluble non-ionized salts.

I give two examples of cases treated with good results. The number of patients I have had under treatment is naturally small, but all considered themselves improved, and where the pain was a prominent feature relief was well marked. Whether any cases are permanently cured is a matter that only time can show.

CASE I.

Mr. B., aged 48. No family history of gout or rheumatism. Has led a steady life, always athletic, has played much tennis and golf; always in comfortable circumstances, no business or other worries. Has lived in a tropical moist climate for the most part of thirty years, and developed his rheumatic attacks there; they are always very bad of late during the "monsoons," and he has been confined to bed or only able to hobble about during these attacks. Is much better directly he gets home to England. Condition diagnosed as "rheumatoid arthritis" by doctors abroad, as "chronic rheumatoid arthritis" by the London physician who sent him to me.

Present Condition.

Pain and difficulty in moving about, especially in getting downstairs, in both knees and both ankles. Other joints not painful. Cannot walk for any distance without considerable pain. Grating and creaking very marked in both knees and ankles on passive movement; thickening and puffiness of these joints. Heart and other organs normal.

Treatment.

Radiant heat ten minutes to knee, ten minutes to ankle, followed by cataphoresis for twenty minutes with lithium iodide 2 per cent. solution, 70 milliamperes run between knee and ankle. The right leg had the first treatment; the next day he said the "right leg felt fit for anything, while the left was, of course, the same, and that there was a marked difference between the two, whereas both had been pretty equally bad before." The second treatment was to the left leg, and this made both legs equally comfortable. He continued alternate treatments to right and left legs, and after the tenth was playing golf without ill effect. The grating of the joints has disappeared; he has no pain whatever.

CASE II.

Mrs. A., aged about 35, married, always in excellent circumstances. Family history of gout. The patient had had no rheumatism before present illness, no sore throats. Health always robust, fond of games, played golf until onset of this attack. Has spent much time gardening, her hands being frequently wet and cold. Has lived in a low-lying town which has a very damp subsoil. Rheumatoid arthritis commenced twelve months ago in the proximal interphalangeal joint of the left ring finger; during the first six months it attacked the carpal, carpo-metacarpal, and radio-carpal joints of the right hand, and eventually the left wrist in a similar manner. She was advised to come to Brighton, and forbidden by her London physician to return to her former dwelling. She was placed on

iodides, arsenic, guaiacol, aspirin at various times without much benefit. One feature of her case was the severe paroxysmal pain that came on in the wrists about 3 a.m. and continued till 6 a.m. Radiant heat to the wrists for twenty minutes, followed by twenty minutes lithium iodide 2 per cent. cataphoresis. After the second treatment she had no more night attacks, after suffering from them for three months. She gradually improved very considerably. The pain left her absolutely; the puffiness and swelling of the wrists diminished greatly; she regained power of using her hands for ordinary purposes, but they are still weak.

THE RESTORATION OF VISION IN THE SQUINTING EYE.

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DURING the past ten years the treatment of squint has made great strides. Formerly glasses alone were prescribed; then supervened the period of promiscuous tenotomies which by their untoward results produced the natural effect of setting back the operative clock until the time had passed for obtaining the best results.

Thanks to the able and painstaking researches of Worth, a scientific line of treatment was evolved out of the chaotic conditions into which matters had got. He showed that a defective cerebral function—named by him the fusion faculty—had a great deal to do with the development of a squint, and that to cure it this faculty required cultivation. Thus it has come to be generally recognized that the presence of a squint is but one sign of other defects, and that the restoration of the normal alignment of the eyes is but a portion of the treatment which a squint requires.

The presence of a squint, in addition to its outward manifestation, nearly always indicates (1) some error of refraction, (2) a defect in the fusion sense, (3) a defect in the vision of the squinting eye, which varies with the age of onset and duration. Therefore the scientific rectification of strabismus includes measures to correct the above. Glasses correct the refractive error, orthoptic exercises or operation remedy the faulty position, training with the amblyoscope overcomes the cerebral defect, and at the same time certain measures can be adopted in some early cases for restoring the defective vision.

Up to the present time we can only completely cure a squint if we get it quite early in life, before a habit of using only the straight eye has resulted in blindness from non-use—amblyopia ex anopsia—in the squinting eye. The limit of age at which such restoration can be accomplished is held to be six years. That such is the fact in the majority there is unfortunately very little doubt, yet that there are exceptions and that such exceptions may perhaps some day prove to be commoner than is at present thought to be the case I think the circumstance I have to report will prove. Excepting congenital cases of blindness in one eye, what right have we to assume that restoration of useful vision cannot be obtained in an organ which as far as we know once performed its full share of duties? If we fail to obtain its restoration of function surely it is more logical to attribute the non-success to the methods adopted than to the materials on which we have to work.

Holding such views, I have for a long time been seeking a method for obtaining what up to the present has been considered impossible of accomplishment, and though at present one cannot produce any very great results, what one has obtained more than justify one in persevering along the same lines.

Worth's amblyoscope was invented by him to overcome the defect in the fusion faculty, by training the brain to recognize the presence of the two pictures which the possession of two eyes affords. Briefly, the method consists in putting before the eyes two pictures, and by increasing the illumination in front of the eye with the defective vision and decreasing that in front of the better (or more used) eye a simultaneous recognition of both is obtained on the brain. Eventually both pictures are recognized under equal illumination and by mechanical means they are superimposed until by degrees they are blended by the brain into one true picture appreciative of depth and perspective. This amounts to the restoration

of what for want of a better term I call "landscape vision," and can be accomplished in a fair number of cases in which amblyopia ex anopsia blindness from non-use has supervened in one eye.

But of what practical use is this "landscape vision" to the patient who in after-life will desire to read, write, or sew with the amblyopic eye? If injury, or operation, or disease supervene in the straight or seeing eye the value of the originally squinting eye will be very little if it cannot be of use in such pursuits. Hence it is obvious that before we can assert we can cure a squint in the fullest sense of the word we must be able to restore to the eye and brain the power to recognize letters and figures. Up to 6 years of age this can be accomplished by the methods so ably laid down by Worth; after this age we must seek other methods. How far this restoration can be accomplished and in what percentage of cases, it is impossible just at present to say, but of this fact there is no doubt that there are a large number of patients with a squint in whom the amblyopia is only latent, and in whom the full, or a very great, restoration of useful vision can be obtained. It has been clearly proved that to leave a squint to be grown out of or until the child is old enough to be operated on is unjust and unscientific, also that the proper course is to adopt amblyoscopic and training exercises as promptly as possible. So now it is just as unscientific to put on one side all attempts to teach the eye to read simply because up to the present no success has attended the efforts made to restore vision in an amblyopic eye. There are cases which are not successful and others which yield gratifying results, and it is impossible, without investigation, to distinguish the two.

The investigation of any case of squint should always include an examination as to presence of the fusion faculty, and in those cases in which it cannot be developed we should not conclude that the monocular visual perceptive centre is incapable of being awakened. If we cannot obtain a blending of the two images, we ought to endeavour to obtain recognition of either picture and then proceed to smaller and smaller objects until printed type can be recognized; in fact, it is not necessary in every case to obtain fusion, it frequently being advisable to use a prism base up before one eye so as to obtain diplopia, and by this means cultivate each visual centre in the brain. We can go further with the use of prisms, and cultivate those other inert portions of the retina in cases where a false macula has become developed, the indications for such developing as the case proceeds.

The case I have to report is as follows:

A youth, aged 11 years, began when about 2 years of age to squint with the right eye, which turned in. Teething was supposed to be the cause. There was no history of any relation having squinted. He was seen by an ophthalmic surgeon at

4 years of age, was given in the right eye +.05 D. sph. and in the left + 1 D. sph. Apparently no attempt was made to test him as to the presence of the fusion sense. He wore the glasses constantly, and was told that the case was proceeding so satisfactorily that in a few years' time he would be able to do without them. The patient was an exceptionally brilliant boy, and at school had taken all his class prizes and had not missed a single day's attendance.

He was brought to me in November, 1907. His right eye turned in about 8°, fixation was possible but slow; the left eye was used in both near and far vision. He was wearing the glasses mentioned, and with them the vision in the left eye was $\frac{3}{8}$, whilst in the right it was only $\frac{1}{8}$ with or without glasses. Tests with the amblyoscope showed there was deficient perception to pictures in the right eye; but after half an hour's graduation of the illumination recognition of both pictures was obtained, and this was quickly followed by blending.

When seen on December 11th the vision in the right eye was two letters of $\frac{3}{8}$, and with the amblyoscope true fusion was elicited. In place of the amblyoscopic pictures a set of type-printed letters on transparent sheets of celluloid was inserted. These sheets of printed letters contained two-sized type, the larger being equal to letters readable at 9 feet, and the smaller equal to Jaeger No. IV.; these sizes alternated with each other. It was found he could slowly make out the larger letters, but skipped the intervening smaller ones. He was instructed to cover his left eye with his hand when doing his lessons and endeavour to teach his blind eye its letters. At the same time his parents—who most ably co-operated in my endeavours—at my suggestion bought him an alphabet set of letters on pieces of card, with which he built up words with his left eye and then endeavoured to interpret them with the right eye.

December 19th. Fusion exercises of both pictures and type were carried out, and it was found that as the tube in front of the right eye was moved in the direction which brought the letters over the outer portion of the retina they became