

cations, the strength and character of the remedial agent—if any—used with the rubbing, and the susceptibility of the patient, are prime factors in the successful employment of massage, and are quite as important as the selection of cases appropriate for this remedy. Let us consider these in the order stated.

In indirect massage the act should never of itself produce pain, and rarely more than a passing discomfort. I think little is to be gained by the employment of much force. If the lids are the parts to be treated, the patient should be told to look down in massaging the upper lid, and up in the case of the lower lid. In each instance, the other lid should be drawn away from the one undergoing massage. If the cornea is to receive attention, the patient should look straight forward. The duration of the séance must be varied according to circumstances; it should rarely exceed three or four minutes. The tip of the second finger I have found the best instrument for the application, as it can readily be used for all the movements of palpebral massage, circular, centrifugal, and centripetal. It is also well adapted to the to-and-fro pressure required to reach the conjunctival areas about the inner and outer canthi. Once daily to twice a week constitutes the range of frequency of these applications. It is better in most cases to perform a gentle, non-irritating massage of even ten minutes' duration daily than a rough, painful rubbing twice a week.

As to the strength and character of remedial adjuncts, and without discussing the action of massage, which forms no part of this paper, I have come to rely on variations of some half dozen remedies. When I desire to use massage for its own sake, as I usually do, I instill a drop or two of cod-liver or pure castor-oil, telling the patient to wink and move the globe about so as to thoroughly distribute the oil throughout the conjunctival sac before beginning massage. For the rest I greatly prefer oily solutions or mixtures to powders or collyria. When these oleaginous compounds are made perfectly smooth and of a consistency that permits of their ready distribution over the eyeball, it is surprising how little pain or discomfort is set up even by strong doses of such irritants as mercuric chlorid, silver nitrate, etc. This is probably due to the fact that massage has an anesthetic action, probably due to emptying the capillaries and lymph-vessels of their contents and to the continued pressure on the nerve endings.

Most observers find in mercurials of various strengths, combined with all sorts of oleaginous excipients, the most useful massage agents, and my experience coincides with theirs. I pass around for your inspection a brown ointment of this character that I have found very effective, and one that combines qualities of great value in ocular massage. It is nothing but the old citrine ointment—the ointment of the nitrate of mercury—made with brown cod-liver oil instead of lard-oil. This, after standing exposed, to get rid of irritating nitrous fumes, for a week or ten days to the air, but not to dust, may be further diluted with from 25 to 50 per cent. of cod-liver oil. It should be dropped from the end of a glass rod or silver probe into the lower sac. If the massage movements are begun at once, the smarting is very slight and transient, even when the stronger mixtures are employed. The subsequent action of the remedy can be modified as desired by the length of time, usually an hour, before it is washed off the eyelashes with warm water.

At the end of, or during the act, combinations of the remedy with the ocular secretions—especially mucus—

should be coaxed out of the sac by small "dabs" of damp cotton, or, if watery or glycerin mixtures or solutions be employed, by the irrigating stream, and the stroking movements resumed until nothing further comes away.

I wish to emphasize the contention that one rarely gains anything by inducing a marked hyperemia of the scleral or ciliary vessels by using force or by the employment of very irritating adjuncts in massage. A little smarting, that passes off in five minutes; a temporary congestion of the already visible vessels, and, perhaps, some foreign body sensations are all that are justifiable. I might generalize by saying that the patient, half an hour after the lid friction, should not experience any added discomfort. It is evidently impossible for me to even enumerate the various diseases of the lid proper, conjunctiva, lachrymal apparatus, cornea, and of the interior of the eye, in whose treatment massage has many warm friends. In a general way its most satisfactory employment will be found in chronic diseases of the eye borders and substance, in almost all those subacute and chronic infections of the conjunctivæ that one commonly includes in the title "conjunctivitis"—with or without an adjectival affix or prefix—in the second stage of acute inflammation of the conjunctiva, in most forms of ulcer of and deposit in the cornea, and it may be employed for the temporary relief of glaucoma and in some forms of retinal embolism. It is not indicated in the early stages of "acute conjunctivitis" and of "keratitis," in all forms of true trachoma, in spring catarrh—although Costomiris and others dissent from this opinion—in diseases of the iris, ciliary body, lens, choroid, vitreous, or optic nerve. Finally, while I am very skeptical of its efficacy in the absorption of the connective tissue that composes the mass of a true cicatrix, I am convinced that, in young subjects, especially, it does lessen the opacity following ulcer of the cornea. If applied early it promotes the removal of the surrounding infiltrate that would otherwise remain. In the same way it is valuable in the treatment of interstitial keratitis.

USE AND ABUSE OF POTASSIUM IODID IN OPHTHALMIC PRACTICE.*

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Iodid of potash was first used medicinally by veterinary surgeons for the removal of splints from horses. Its efficacy in removing these osseous growths suggested its use for the removal of tumors and exudates from man. Its value in the cure of many tertiary syphilitic lesions soon became apparent, and it is slowly but surely forcing the medical profession to acknowledge that its use is not restricted to syphilitic diseases.

Many years ago I became convinced of its value in the removal of goiter. I recall a case many years since that forcibly impressed on my mind the efficacy of iodid of potash in cases other than syphilitic ones. I was in attendance on a little girl with pneumonia, but resolution failed to become established. The lung remained solid several weeks. The child was slowly but surely dying. The father, a physician, as well as myself felt helpless, and we called in council an old prac-

*Presented to the Section on Ophthalmology, at the Fifty-first Annual Meeting of the American Medical Association, held at Atlantic City, N. J., June 5-8, 1900.

itioner, who prescribed immense doses, as we thought, of iodid of potassium. The rapid improvement was most marvelous. It was such observations as this that led me to gain greater confidence in the use of the drug in the removal of exudates than my previous studies had led me to believe possible. It was while the above case was still fresh in my mind that two patients came at the same time, each having received a blow on the eye, the anterior chamber filled with blood. I determined to try the use of iodid of potassium to absorb the blood-clot in one, and let the other go without specific treatment. The blood-clot disappeared in five days from the case in which the iodid was used. In the other, remains of the clot could still be seen at the end of two weeks. While it is true that a single observation of this kind can not have much scientific value, yet my experience covering a wide variety of similar cases has confirmed me in the opinion that iodid of potash is of value in removing not only hemorrhages, but exudates of almost every kind as well.

I seldom meet patients who can not take the iodid. Sometimes I have discovered that they could not take small doses of the drug without discomfort, but could take large ones quite well. That there may be no misunderstanding, I shall detail at some length the manner in which I usually prescribe the drug. In the vast majority of cases I combine it with bichlorid of mercury as in the following prescription:

R. Hg. chlor. cor. gr. i
Potassium iodid ʒi
Tr. cinch. comp. ʒii
Aqua, q. s. ad. ʒiv

M. Sig. Teaspoonful three times daily in water after meals.

I use this as a menstruum for the administration of the larger doses, and give this prescription:

R. Potassium iodid ʒi
Aqua, q. s. ad. ʒi

with instructions to add 5 drops to each spoonful of the first prescription, increasing 5 drops additional to every dose, thus giving 45 grains the first day, 60 grains the second, 75 grains the third, and thus rapidly increasing the dose up to 500 grains daily. I urge the patient to drink an abundance of water, to eat all the appetite craves, and make no restrictions as to the kind of food. I also insist on frequent hot baths, which I deem most important. I caution the patient not to take the medicine if a full meal has not been eaten, and on the first indication of intestinal disturbance stop the drug entirely for a day or two, or if needs be, until the appetite returns. Administered in this manner, it is rare indeed that I meet a patient who can not take from 100 to 300 grains daily. It is surprising sometimes what enormous doses can be taken without any apparent deleterious effects. I have notes of a patient in the City Hospital who had been there some months with a diagnosis of diabetes. When I entered on my service I examined his eyes and found he had a choked disc, and made a diagnosis of brain tumor, and expressed the opinion that the sugar in the urine was due to the irritation of the tumor, probably near the floor of the fourth ventricle. Iodid of potassium was administered until the dose was increased to 900 grains daily, with complete disappearance of the sugar in the urine, and although this was nearly ten years ago, the patient is still living and enjoying good health. These large doses can not be taken for a long time, but should be pushed to the point of tolerance and then stopped entirely for a few days or weeks, if not an urgent case; in the meantime I administer mercury, iron, arsenic, strychnia, or

other drugs, alone or in combination, as indicated, and then, if necessary, repeat the large doses of iodid as before. This way of administering iodid of potassium has proved most satisfactory in my practice, not only in syphilitic cases, but in many that were not diagnosed as such. In cases in which the patients object to the taste of the drug, I have been in the habit recently of prescribing it in carbonated water, which covers the taste completely and apparently relieves much of the tendency to irritation of the digestive apparatus. I do not wish to be understood as saying that I never give small doses of iodid; indeed, I believe there are cases in which most excellent results may be best secured by small doses continued for a longer time. But I wish to make a plea for larger doses in many non-syphilitic cases, and express the opinion that as a routine practice less harm may be done by large doses given for a brief period than by smaller ones for a longer time.

Of course, the most brilliant results will be attained in cases of choked disc due to syphilitic brain disease, but I have resorted to this treatment in cases of optic neuritis of almost every variety. The urine should be examined, and in the presence of albumin the drug should be used with great caution. I also learned from sad experience many years ago that, in degenerative disease of the optic nerve such as we have in posterior spinal sclerosis, the use of the iodids will do great harm and often hasten blindness. I do not hesitate to give large doses in cases of optic neuritis in meningitis, tubercular as well as other forms of the disease.

I have also had good results in neuritis following injuries of the head, either due to pressure from blood-clots or exostoses following fractures, or effusion from localized meningitis. I have also found the iodid useful in relieving the headaches in cases of brain tumor other than specific ones. Some years ago we had a boy in the Cleveland General Hospital who suffered most intensely from headaches. Opiates always aggravated the pain; almost the entire materia medica was exhausted without avail. It was found that 50 or 100 grains of potassium iodid, followed by a hot bath, would give him relief for a week or two, and sometimes longer. He died suddenly after a hypodermic of morphia given by a physician called in in an emergency. The autopsy revealed a large tubercular tumor of the cerebellum pressing up into the floor of the fourth ventricle, which was enormously dilated, holding a pint or more of fluid. The iodid undoubtedly relieved the pressure, while the opiates increased it, and thus aggravated the headache.

I am tempted to report at length exceedingly interesting cases in which the drug has proved of unusual value, like one I reported recently to a local medical society, of a patient who became totally blind subsequently to cauterization of the turbinated bodies for hypertrophic rhinitis. Rapidly increasing doses of iodid were prescribed until 450 grains were given daily. Perfect vision was quickly restored.

It was not the purpose of this paper to discuss such cases, but rather the ordinary ones that come to our consulting rooms frequently. I have already intimated that I believe the drug to have a specific influence in absorbing blood from the anterior chamber, and I also have faith in its efficacy in removing clots of blood as well as exudates from the vitreous, where, as we are well aware, absorption is a much slower process. In all cases of choroiditis with exudation into the vitreous, I give a relatively favorable prognosis, at least I have no hesitation in encouraging my patient to believe that

with vigorous medication we can clear up opacities of the vitreous, thereby improving vision. This improvement is not alone in syphilitic cases. In cases of progressive myopia in which there is not the slightest suspicion of syphilis, I have witnessed the most marked improvement. Indeed, there is no case of choroiditis in which I would not give the remedy a trial with the expectation of benefit. I have notes of an interesting case of a school teacher with a large subhyaloid hemorrhage, presenting a beautiful picture of a thin layer of bright-red blood covering a large portion of the fundus. Notwithstanding the presence of albumin in the urine, large doses of the iodid were given, with the gradual clearing up of the hemorrhage and restoration of perfect vision. This was five years ago, and the teacher is still at work and apparently in good health.

I have not found the iodids of benefit in secondary syphilitic iritis. These cases are best treated with mercurials. On the other hand, I have found the iodids of great service in the treatment of idiopathic or rheumatic iritis—those cases in which we have great pain running a chronic course, often relapsing; in which the impairment of vision is out of proportion to the cloudiness of the aqueous; in which the pupillary area may be quite free from exudates; in which the eye is tender to the touch; in other words, a cyclitis rather than an iritis, or at least in which the ciliary region is quite seriously involved, with exudation into the anterior part of the vitreous. These are the cases that try our skill, but which often yield to large doses of iodid of potash and hot water used as taught by our ex-chairman, Dr. L. Connor.

Serous iritis, the punctated keratitis of the older authors, is always benefited by the iodids. In these cases, however, I have been contented to use smaller doses. Interstitial keratitis is peculiarly a children's disease, and always runs a chronic course, which can be greatly shortened by the judicious use of iodid of potash. The latter can be much more safely and much more conveniently given in relatively large doses for a short time, alternating with mercury and general tonics, repeating the iodid from time to time as the general health of the child permits. Interstitial keratitis in adults in my experience always runs a much shorter course than in children, due, I believe, to the fact that we can safely give the iodid much more vigorously.

There are a large variety of cases of extraocular paralysis involving the third, fourth, sixth, and fifth nerves, undoubtedly many of them syphilitic, but often due to other causes. It has been my custom to prescribe iodid of potash in large doses without spending too much time in making inquiries as to the etiology, as I believe that prompt and heroic treatment at the beginning is essential to success in the management of these cases.

I must confess that the use of large doses of iodid of potash has been disappointing in the removal of post-operative exudates; for some reason I have not had the courage of my convictions, and in very few cases of this kind have I ventured to give large doses. So many of these patients are old, or feeble, or illy nourished, or have already run a painful debilitating course, I have not been inclined to push the iodid to the extent that I have done in other cases. I can not say the results in such cases have been encouraging.

CONCLUSIONS.

1. Iodid of potash should generally be administered in rapidly increasing doses until from 1 to 500 grains are given daily.

2. The drug should always be given after eating, and well diluted with water.

3. Frequent hot baths are essential to the best results in the use of the remedy.

4. Not infrequently large doses will be tolerated when smaller ones can not be well taken.

5. The use of the large dose is not limited to syphilitic cases.

6. Large doses are indicated in: optic neuritis; ocular paralysis; choroiditis; serous iritis and in relapsing iritis; cyclitis and interstitial keratitis.

7. It is contraindicated in gray atrophy of optic nerve and in most cases of postneuritic atrophy.

8. Albumin in the urine, generally speaking, is a contraindication for large doses of iodid.

9. Young children do not take the iodid kindly and it should be administered cautiously.

10. The remedy is of doubtful value in early syphilitic iritis.

11. Large doses are of doubtful utility in the removal of post-operative exudates, but should be given further trial.

DISCUSSION ON PAPERS OF DRS. WOOD AND BAKER.

DR. J. L. THOMPSON, Indianapolis—I fully agree with Dr. Baker, though it is true I have not given the very large doses he uses, being rather afraid, but in the future I shall certainly try it. Occasionally we meet with cases in which more than four or five grains will produce the most terrible symptoms, in other words, there is an occasional idiosyncrasy. I recall a case of brain tumor in a little girl seen some fifteen years ago, with impaired vision, headache and choked disc, who after treatment by potassium iodid was able to attend school for two years subsequently. An autopsy made later showed sarcomatous tumor of the cerebellum.

Concerning the ointment which Dr. Wood recommends for use with massage I want to say that I accidentally stumbled on that mixture many years ago, in fact, before I went into the Civil War. Later, returning home, I found my friend, Dr. Williams, prescribing the same ointment, which he called the "brown citron ointment." The only objection to it is that ladies complain of its horrible odor. Concerning the use of massage in glaucoma, I have had several cases of hemorrhagic glaucoma in which I have used it, together with eserine and other remedies, of course. I think it would be well to give some of our patients an instrument like that suggested by Dr. Woods, because it gives them something that rattles. I wish I could give many of my patients some instrument that rattles or makes a noise while it is working.

DR. C. F. CLARK, Columbus—Since the Doctor calls for something that rattles, I have one to show him—presenting instrument. I have under my care a patient who consulted Dr. Ayres ten years ago and who has been a high myope since childhood. She has detachment of the retina, with complete loss of sight in one eye and partial detachment in the other. Her condition has improved greatly under potassium iodid. I only learned from her a few days ago that, before going to Dr. Ayres, she had presented to her this circular, which probably the older members of the profession are familiar with, concerning an instrument for reducing myopia. She had systematically produced massage with this rattling instrument for many years, and whenever she had to do some particular work she felt that she helped her eyes by pressing this on the lids. I have no doubt that with this instrument she succeeded in producing the detachment. I have tried it on my own eye and in one or two applications succeeded in making the eye ache for about two hours; I am myself myopic.

I believe in massage thoroughly for many diseases of the eye if properly applied, but it must be always guarded by the physician, and it would be a bad thing for the public to get the idea that by rubbing the eyes as the osteopaths do they could rub away disease.

DR. LEARTUS CONNOR, Detroit—There are two points I would like to speak of. I quite accept Dr. Wood's presenta-

tion on the subject of massage and I have found it extremely useful. The case related by Dr. Clark recalls to my mind the case of an old soldier who had lost one eye from myopia when the other was progressively failing. He went to Cincinnati to attend a grand army encampment, and while there a friend persuaded him to have one of these cups applied. It was applied once and he never saw afterward: from being a useful member of society he was converted into a blind man.

Respecting potassium iodid, I also favor large doses of it, but use it without bichlorid, and suspect that some of Dr. Baker's good results have been due to this attendant drug, which, however, is a different proposition. My method of using it is different from his, in that I usually prescribe it to be taken after meals in milk. I give it in drop solutions so that it may be increased by drop doses, each drop representing a grain. I was quite surprised to hear Dr. Baker say he found it intolerable to children, for in our Children's Hospital I have used it with great satisfaction, and they seem to take it better than adults.

I wish to say a word also in regard to subconjunctival injections to which Dr. Troncoso referred. In a number of these exudates the injections do assist materially in clearing of the cornea, but in other cases, no matter how many injections we have used, there has been only little benefit. As to the selection of cases in which subconjunctival injections would or would not be of benefit we have been unable to determine beforehand. It is necessary to try them, and if benefit results, very good; if not, we discontinue them. I would like to emphasize the remarkably quick relief from pain given in cases of iritis and cyclitis by these injections. I have seen many cases of these diseases in which the pain was excessive and in which no relief was obtained from other remedies, but they were promptly relieved by one or two injections of a few minims of normal saline solution.

DR. C. A. VEASEY, Philadelphia—I am quite sure that most of us who have had any experience with massage of the eye-ball will agree with almost all Dr. Wood has said in his excellent paper. It is perhaps a question not so much of the employment of massage but of the manner in which it shall be employed that raises points of difference. In the service of Dr. De Schweinitz, at the Jefferson Hospital, it has been our custom for years to use it to assist in the removal of exudates found in the layers of the cornea and especially in interstitial keratitis. Formerly it was our custom to apply the massage ourselves, but in a large clinic that proves to be impracticable. We then tried to teach the patients to use it, but quite recently we adopted something of an innovation by employing a trained masseuse. Certainly in the few opportunities we have had to make observations since starting this we have every reason to believe the results are better than those obtained by previous methods. The substance which we have mostly used has been the yellow oxid ointment. A small portion is placed in the conjunctival cul-de-sac, and the lids being closed a number of circular movements are made with the tip of a finger on the upper lid, and after a short time this is followed by radiating movements from the center toward the periphery, and the sitting ended with a few tapings.

DR. FRANK C. TODD, Minneapolis—I believe in the use of potassium iodid for eye diseases and in strong doses, but I have not been able to use it internally as strong as Dr. Baker recommends. I believe I have been able, however, to get it into the system in as great amount in another way. I have been in the habit of using inunctions of potassium iodid, just as it is customary to use mercury, and with very good results.

DR. G. C. SAVAGE, Nashville—There is one practical point I would like to mention concerning the administration of potassium iodid. I do not know where I got the idea, but, somewhere and somehow, I learned that jaborandi, in promoting the absorption of watery effusions in acute inflammatory processes, aids the potassium iodid in effecting this absorption of plastic effusion. I give the fluid extract of jaborandi in 15 to 25 drop doses at 9, 3 and 9 o'clock, and the iodid in increasing doses after each meal.

DR. J. A. LIPPINCOTT, Pittsburg—I have had some experience with subconjunctival injections of bichlorid and normal

salt solutions, and in some cases it is a method of treatment of undoubted value. The writer of the paper mentioned that Darier used acoin to obviate the pain. My patients complained very little if the eye was thoroughly cocaineized and if a small quantity of cocain was added to the solution before injecting.

I have been using massage for many years in some affections of the eye, but recently more especially in glaucoma. There is no doubt in my mind that in massage of the eye-ball we have another means of prolonging vision in glaucoma, especially in the chronic inflammatory form where there is gradual tendency for the visual field to contract and blindness to ensue ultimately. I think massage in those cases does tend to relieve the pain, keep the eye-ball soft, and in conjunction with other measures to preserve the vision.

As to large doses of potassium iodid, I have used them, but not with as much enthusiasm as our friend Dr. Baker. I have seen others, however, use it in that way with benefit.

DR. G. A. ASCHMAN, Wheeling—There is one disease of the many that Dr. Baker mentioned in which I have had some particularly good results with potassium iodid, that is detachment of the retina. This is a disease so difficult to treat and so many things have been tried for it that I think potassium iodid, which does so much good in removing exudates, should be tried. I have given it after the method recommended by Dr. Connor. I have under my care at present a young girl of 18, whom I think Dr. Lippincott has seen, on these increasing doses. When first seen her vision was only the counting of fingers and the detachment covered one-fourth of the inferior quadrant of the eye, but it has now diminished two-thirds and her vision is 15/70. I would like to ask Dr. Baker whether he has tried the large doses of potassium iodid for this affection.

DR. URIBE TRONCOSO, Mexico—Dr. Veasey certainly stated the truth when he said that subconjunctival injections are of no great value in certain cases of interstitial keratitis, but there are some conditions in which the clearing of the cornea is marvelously assisted by this means. When I find that three or four injections do not bring success I think their use must be stopped. In regard to the pain produced by them I have not been so happy as Dr. Lippincott, for my injections have always been very painful, notwithstanding that care was taken that the needle should not penetrate Tenon's capsule, but only the conjunctiva. Darier proposed acoin, but, as I said in my paper, unfortunately I do not succeed in relieving the pain with it. Cocain can be added only to the cyanid of mercury because when added to the bichlorid it is decomposed and loses entirely its anesthetic properties. (Darier.) The action of the cocain is only temporary and a quarter or half an hour after the injection the pain begins, and lasts about two hours.

DR. CASEY A. WOOD, closing discussion—I would say that so far as my knowledge goes, I believe we are indebted to Dr. Moyer, professor of therapeutics in the University of Chicago, for the explanation of the different action of potassium iodid in large and small doses. When given in small doses and without a great deal of water it forms organic combinations in the stomach that produce irritation, but when given in large doses its action is mainly that of a diuretic, especially if given with a quantity of water. It is then carried off by the kidneys, as well as by the skin and mucous membrane. If this be true it explains why in large doses we get the benefits of the drug without its deleterious effects. I heard Professor Moyer recently say that he was in the habit of giving as much water as the patient could possibly drink and the larger the quantity taken the less frequently the disagreeable symptoms of iodism are present. In my experience that is true and I frequently give 400 or 500 grains a day.

I was very much interested in what Dr. Thompson said about the "brown" ointment. I have never laid any claim to originality in this matter, but I have not as yet discovered the inventor of what I consider a valuable addition to the ophthalmic armamentarium. I never advise patients to use massage at home, for I think it is possible for them to do harm with this and other agents employed with the massage.

DR. A. R. BAKER, closing discussion—It was with a great deal of hesitation that I presented this paper, because I have been criticised by some of my medical friends at home for giving such large doses, and the sanction that has been given to the use of large doses of potassium iodid is very gratifying indeed. Such an excellent authority as Jonathan Hutchinson, I believe, says it is never necessary to give over 15 grains at a dose. I am very glad to hear Dr. Connor's favorable experience with young children. In the early part of my practice I thought I had injured some infants by the use of large doses, and though I was surprised recently in looking over my notes to see that I was giving such large doses to children with good results I felt that it was necessary to apologize for it in my paper.

In regard to Dr. Aschman's question concerning detachment of the retina, I would say that I have used it in a number of cases with doubtful benefit. In some cases where there was doubt of the diagnosis I have had improvements; it is certainly worthy of further trial in these cases.

ELECTRIC RECORDING PERIMETER.*

WILLIAM M. SWEET, M.D.

PHILADELPHIA.

Of the many perimeters which have been devised for recording the field of vision, the instrument devised by Dr. Malcolm M. McHardy, of London, has met with the most favor. It is an excellent instrument, and whatever its defects, they are to be found in all similar forms of apparatus in which the test object is moved by a flexible cord. The instrument here shown was devised with a view of correcting the faults which experience shows exist in the ordinary form of perimeter. Apart from the use of small electric lamps for the fixation spot and for the test object, it differs in important details of construction from the usual form of perimeter. The arc which ordinarily carries the movable test object is replaced by a steel tube, at the end of which are cog-wheels for rotating a metal arm carrying a small electric lamp. Motion is transmitted to this arm by a shaft running through the center of the tube; the rotation of this shaft is communicated by suitable gearing to a slide carrying a steel point, as in the present form of perimeter, for making the record on the chart.

The electric lamp at the extremity of the rotating arm is designed for the test-object, two discs being provided in front of the lamp, one containing openings of various sizes, and the other holding circles of differently colored glass.

The usual form of chin-rest is employed, adjustable to various heights. The fixing point consists of a small mirror, which reflects the light from an electric lamp placed above. This permits the fixing point to be made of small size, so that the illuminated test-object may pass behind it, a matter of importance in the plotting of scotomata near the center of the field.

The record of the field is made in the usual manner by pressing the chart against a steel point. On the upright support of the perimeter is a steel pin, fitting into an opening on the arm of the chart-carrier. By this means the errors which often occur from sagging of the chart-carrier are avoided. The steel pin is adjustable to permit a heavy or light puncture on the recording chart.

The instrument is designed for a chart about six inches in diameter, experience proving that the small

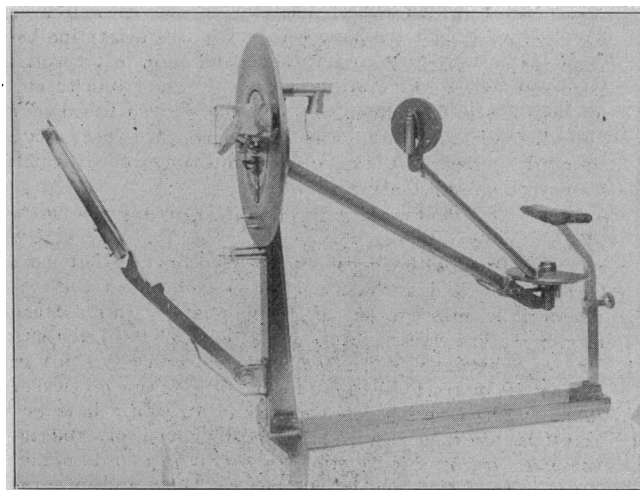
form of chart tends to confuse the details of the field, especially when it is desired to record the form and color-fields on the same sheet.

Since the illuminated object passes behind the fixing point, each meridian of the field may be measured through an arc of 180 degrees without rotating the main portion of the instrument.

An important feature of the instrument is the button on the base of the stand for extinguishing the light of the test-object. When the patient first recognizes the light as it enters the range of vision, the pressure of the finger on this button puts out the light of the test-object, and determines the correctness of the patient's first answer.

The electric lamp may be operated with small storage cells, or, if desired, by the ordinary direct or alternating commercial circuits. The three-cell dry battery employed for small electric lamps gives satisfactory illumination, and may be replaced at moderate cost.

The advantage of beveled gearing, with absence of lost motion, over flexible cords for operating the test-



Electric Recording Perimeter.

object, will be apparent, while the substitution of a noiseless moving light, of constant intensity of illumination, for the present traveler, carrying colored discs, whose brightness varies with the character of the daylight, insures visual fields which are uniform for purposes of comparison.

The perimeter is made by Queen & Co., of Philadelphia, who have admirably worked out the mechanical details necessary to assure an accurate instrument.

1205 Spruce Street.

DISCUSSION.

DR. H. F. HANSELL, Philadelphia—The advantages that this perimeter has over those in use are its noiselessness, and facility for the accurate measurement of the limits of the field by eliminating the possibility of deception and imperfect observation on the part of the patient. Its single disadvantage is its expense.

Water Treatment of Catarrh of the Upper Air Passages.—According to Linkenheld's description of his hydropathic treatment of catarrh, published in the *Deu. Med. Ztg.* 45, the temperature and force of the stream are the chief factors in the cure and not the chemical composition of the fluid used. He irrigates the upper air passages with plain water at 28 C. in acute catarrh. In the hypertrophic variety he rinses alternately with water at 27 and 32 C. In atrophic catarrh he uses large amounts, .5 to 2 liters of water under considerable pressure, alternating 27 and 32 C. with 18 C.

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