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Use of Diaphoresis and Diaphoretic Agents in Ophthalmic Therapeutics.



USE OF DIAPHORESIS AND DIAPHORETIC AGENTS IN OPHTHALMIC THERAPEUTICS.

HIRAM WOODS, M.D.

BALTIMORE.

To properly estimate the therapeutic value of an agent, allowance must be made for the natural enthusiasm of those who introduce it and who often record results which later experience fails to confirm, and the tendency of certain things to remedy themselves, the exciting cause having been removed. Disappointment may ensue because too much is expected. Credit may be given when none is due. Truth lies between these extremes, and is to be reached, it seems to me, by finding out what one should look for, basing judgment on the physiologic effects of the remedy, and the teachings of clinical experience. An example of what one may, not illogically, term therapeutic enthusiasm and therapeutic chaos, is found in the statements of books on general therapeutics and those on eye diseases, regarding the use of diaphoretic agents in ocular affections. If we could accept, for instance, all of the following from Potter's "Materia Medica," pilocarpin would be little short of an ocular panacea. Says this writer: "Ophthalmologists employ pilocarpin with most excellent results in the amblyopia of alcoholism, and that from the use of tobacco, in detachment of the retina, chronic iritis, keratitis, glaucoma, hemorrhage into the vitreous, atrophic choroiditis, white atrophy, to promote resolution and absorption in inflammatory conditions with exudation." Bartholow and other writers indicate practically the same scope. The student turning from this general advice to special works will, I think, be disappointed if he expects to find specific and positive information as to what in this list is true and what is not. Most of our special writers indicate that diaphoresis has

been recommended or may be tried in these conditions; but in no text-book with which I am familiar is there the positive teaching the subject deserves, and which is justified by our present knowledge. Scattered through current literature are many most interesting and instructive articles, but they are so scattered that their usefulness is greatly lessened. The object of this paper and the paper by Dr. Woodruff is to set forth briefly what, in the opinion of the writers, may be theoretically expected in ophthalmic therapeutics from diaphoretic agents, and the extent to which their own and others' clinical observation confirm or contradict claims from time to time put forth for this method of treatment. I regret that my recent illness has prevented such a search of current literature as I wished to make, and confined me to articles at hand or with which I was previously familiar. Still they cover more or less completely the principles involved.

Normal sweating is the result of glandular secretion. Physiologists no longer hold that transudation from the cutaneous blood vessels is its most important element. Says Stewart in his "Manual of Physiology": "Though an actively perspiring skin is in health a flushed skin, the vascular dilatation is a condition and not the chief cause of the secretion." the sweating produced by exposure to high temperature is normally brought about by nervous influence and not by direct action on the secreting cells." How far is the profuse sweating from diaphoretic agents, or high temperature employed in baths or cabinets, to be attributed to secretion from nerve stimulation and how far to transudation from cutaneous blood vessels? That the sweat glands can be stimulated to such an abundant secretion as is observed seems almost incredible. the great salivation, sometimes produced by pilocarpin, shows that glandular activity plays an important if not the main part.

Secretions, however, must ultimately be derived from the blood, and there is doubtless a large element of truth in Hansell's1 statement: "The efficacy of pilocarpin is, I believe, to be attributed to the inordinate activity of the lymph system induced by its presence. By depriving the peripheral vessels of a large proportion of their fluid contents, those of the internal organs meet

^{1.} Philadelphia Polyclinic, Nov. 20, 1897.

the deficiency, thus eliminating morbid products to-

gether with physiologic excretions."

If the therapeutic efficacy of diaphoresis is due solely to this vascular effect, equally good results should follow similar action on other vascular areas, which, for our purposes, are essentially peripheral. Those of the intestines and the use of salines and hydragogue cathartics illustrate. The copious watery evacuations from these agents are not, however, at least in my experience, followed by anything like the results observed after the use of diaphoretics. Nor does emptying the cutaneous vessels, with compensative filling from internal structures, explain the good results of small doses of diaphoretic agents, which do not produce copious sweats.

There must be something besides this transudation from peripheral vessels, and, I think, we may well consider in this connection the nervous influence which lies behind the diaphoresis. Pilocarpin is the drug in most common use. It acts on the skin by its stimulating effect on the cerebrospinal nerves supplying the sweat glands. Another of its physiologic effects is its inhibitory and paralyzing effect on the vasomotor system. One is surprised—at least I was—to note the similarity between the physiologic effect on the eye of pilocarpin and the results of section of the cervical sympathetic nerve or ganglion, when reading the scholarly paper presented to this Section a year ago by de Schweinitz. If one has occasion to observe cases of bad effects from diaphoretic agents—the nausea, vesical disturbance, cardiac weakness, etc. -he will find abundant evidence, that in both its stimulating and depressing effect, a diaphoretic has marked nervous influence. By its action on the vasomotor system dilatation of the small arteries, with lessened resistance to blood flow and heightened local temperature, are produced. It seems to me, then, that in estimating the cause of the efficacy of diaphoretic agents, we should count first, as Hansell has said, depletion of cutaneous vessels; and secondly, the action of diaphoretic agents, pilocarpin particularly, on the small arteries.

From this we can draw two theoretical conclusions which clinical experience confirms: 1. Diaphoretic agents should have their greatest efficacy in structures richly supplied by blood vessels. 2. This efficacy should

show itself in lessening of hyperemia and removal of exudates.

Of ocular structures the uvea, and hence the vitreous, retina and orbital tissues seem to present most prominently the anatomic and physiologic characteristics. Certain lesions with which the use of diaphoresis has been associated can, I think, be excluded. Atrophy of the optic nerve, no matter what the primary cause nor how clearly it might have come earlier, under this plan of treatment, is out of the question; so is optic neuritis, dependent, as it nearly always is, on extraocular disturbance. An exception must be made here of certain retinal lesions which may be accompanied by more or less papillitis.

It is equally irrational, I think, to apply this treatment to choroidal atrophy, cicatricial changes in the vitreous or uvea following long-standing iridochoroiditis, "chronic iritis" (in the sense of irritative symptoms persisting after an iritis has recovered with synechiæ, and to be distinguished from relapsing iritis), retinal detachment resulting from cicatricial contraction, primary glaucoma. All of these lesions are either essentially incurable or else are better treated in other ways. Whatever good seems to ensue in such patients from the use of diaphoretic agents is probably due to their influence on the choroidal circulation, and hence on the vitreous opacities; but the underlying diseases are not influenced, and in glaucoma time and possibly opportunity is lost.

In another class of cases there is little probability of good, because the tissues involved are not sufficiently vascular to respond. I allude to keratitis and affections of the sclera. In such of these cases as seem to have been helped, I incline to the opinion that a more careful diagnosis would have shown some form of uveitis under-

lying the superficial disturbance.

Excluding all the above, there are left many lesions which are most satisfactorily treated by diaphoresis. They are acute troubles in the uvea, retina, orbital tissue and toxic blindness. Uveal disturbance will be presented at length in the paper of my friend, Dr. Woodruff. I want, however, to mention in passing three observations made this past winter in cases of iritis. All three were of rheumatic origin, two private cases of my own, and one a hospital patient of my colleague, Dr. F. M. Chisholm. In both of mine, atropia seemed to di-

late the pupil a very little, and then, in spite of pushing it to constitutional effects, using an eight-grain solution, and finally the atropia discs, I could not obtain further dilatation. One patient was in intense pain, the other suffered only moderately. The former was. given a copious pilocarpin sweat. The latter was sweated, somewhat unintentionally on my part, by taking an unusually large dose of salicylate of sodium. In each instance, the day after diaphoresis both pupils dilated ad maximum. An interesting thing was then observed, viz., that there were no points on the lens surface indicating synechiæ. Apparently the pupil was kept small through intense iridic hyperemia, and dilated when this was relieved. Chisholm's case was similar in essentials, and had resisted eleven days of strong atropia. There were, however, marks of synechiæ.

A case illustrating the ease with which one can think he has obtained results which he has not is the following:

A young colored man came into my clinic two years ago with a history of defective sight for a fortnight, terminating in pain, which latter symptom led his physician to send him to a hospital. He was almost entirely blind. Pupils were immovable and a little larger than normal. Corneæ were steamy, tension increased, nearly plus 2. I advised immediate iridectomy for glaucoma, which the patient declined. He was put to bed, eserin used locally, and he was given three profuse jaborandi sweats on successive nights. Vision improved, and the case proved to be one of choroidoretinitis with iritis in its later stage, and secondary glaucomatous symptoms. Later I found spots of deposits on the posterior surface of the cornea—so-called descemetitis. Probably I should have found them at first had I looked for them, but it was primary glaucoma, as first supposed.

In leaving the subject of uveitis, I want to urge the systematic study of Descemet's membrane for these spots. As de Schweinitz, Friedenwald and others have pointed out, they are present nearly always in disease of the uveal tract, and when found in connection with such symptoms, as in the case just narrated, or those of keratitis interstitialis or scleral affections, point to the uvea as the seat of the underlying disturbance.

A number of cases of detachment of the retina, cured by diaphoresis, have been recorded. The method employed in most of them has been to confine the patient to bed and administer sweating doses of pilocarpin daily or on alternate days for six to ten times. Some clinicians have advocated the use of small doses as equally efficacious, and have not thought confinement to bed necessary, except for two or three hours when the treat-

ment was given.

An interesting discussion of the subject can be found in the Proceedings of the British Medical Association held at Montreal in 1897. Mittendorf claimed excellent results "in cases of opacity of the vitreous and especially if associated with detachment of the retina" from the administration three times daily "for a long time" of pills containing 1/100 of a grain each of pilocarpin. Holt of Portland and Burnham of Toronto advocated the use of small doses, preferably by hypodermic injection. The most striking report came from Nettleship, who had a man with complete detachment of the retina, high degree of myopia, and no light perception in either eye. He used pilocarpin, and the result was satisfactory. He could read large type, but he could

not say he could hold that.2

Many of the reported cases give little data regarding the history and condition of the eye, besides stating that the retina was detached. Alt of St. Louis, however, reported in this discussion the case of a girl with high myopia, in whom the retina had become detached, and had remained so for eleven years after the diaphoretic treatment. Like most oculists who read these reports six to ten years ago. I used the sweating treatment for retinal detachment as opportunity offered. In the class of detachments which is most numerous—in myopic eyes with choroidal atrophies and floating vitreous opacities—my individual experience has been disappointing. It has sometimes occurred to me that maybe a warning given in 1892 by Spalding of Portland might be repeated. In an article in the Archives of Ophthalmology, advocating the use of pilocarpin in cases of hemorrhage into the vitreous, he speaks of the possibility of confounding the black appearance of the blood in the vitreous chamber with a detached retina, and insists on confirmation of the ophthalmoscopic diagnosis by field examination and demonstration of a scotoma. Be this as it may, I do not recall ever seeing in my own or the practice of colleagues a permanent cure of retinal detachment in a myopic eye with choroidal atrophy and floating vitreous opacities. Twice I have seen reat-

^{2.} Ophthalmic Record, October, 1897.

tachment and improvement—very little—of the field; but they relapsed. Vitreous opacities improve, but this is not cure of the detachment. I have, however, seen three cases of reattachment in eyes which were not myopic and which did not show the chronic degenerative changes observed in the class just under consideration. Acute choroiditis was present in two of these cases, both hypermetropic, and exudate from the choroidal vessels seemed the only explanation of the detachment. Rest in bed with antisyphilitic treatment effected absorption in one. I saw the man several years afterward, and the retina was still attached, but that portion of

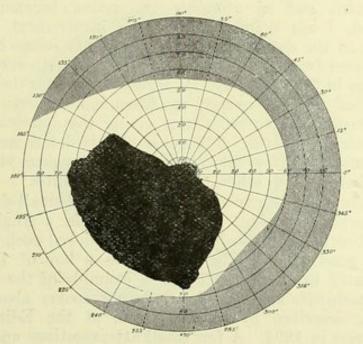


Figure 1.

the fundus was blind. Later the eye developed cataract. The patient was first seen in 1889, and disappeared five or six years ago. The other eye remained good. A second case presented, in hypermetropic eyes, double detachment following rapidly the onset of severe choroiditis with floating vitreous opacities. Cause was indeterminable. The case was reported in an analysis of choroidal cases at the Saratoga meeting of this Section in 1902. Pilocarpin was used, with rest in bed. The retinæ reattached, but there was no improvement of vision in the affected field. The only case in which I have seen apparent improvement of vision is now under observation:

A woman, 22 years of age, came into my clinic the second

of last March. She had a positive central scotoma in the left eye. The right was normal. A detachment of the retina, apparently involving the fovea and upper and inner quadrant, was made out. Her scotoma on admission is shown in Figure 1, and was practically the same eighteen days later. She was kept in bed, with pilocarpin sweats three and four times a week for four weeks. At that time her scotoma was as seen in Figure 2, and central vision 20/30. I last saw her April 19, nearly three weeks after her discharge, and the condition was unchanged.

I confess to some misgivings of my own diagnosis, based on comparison of the fields at the beginning and end of treatment. While there certainly was a detachment and as certainly the retina became reattached, I am skeptical about the involvement of the fovea in the detachment. Central vision seems to have improved from nothing to nearly normal, with very little change in the periphery. It would be easy for the upper detached retina to overlap the fovea, and so shut off central vision, at the same time giving the appearance of involving the fovea. The cause of this detachment was a mystery. A few fine muscæ were in a clear vitreous, but there was no other evidence of choroiditis.

I have had no experience in the use of small doses of pilocarpin in retinal detachment, but in a single case of retinitis seen a few years ago I employed such dosage with good effect. The patient was a boy of 12 who presented in one eye a beautiful example of the exudative retinitis, arranged in radiating spokes about the fovea, described by Marcus Gunn at the Edinburgh Congress in 1894. A few small extravasations and mild papillitis completed the picture. Otherwise the boy was in health. Prolonged exposure to glare from snow was the only possible cause I found. After the mercurials and iodids had failed, the administration of pilocarpin in one-thirtieth grain doses cleared the exudates in a month.

The good effects accomplished by diaphoresis in general medicine in the treatment of nephritis, effecting elimination of products which should go off through the kidneys, suggests its usefulness in toxic amblyopia. I think one has to be very careful how he draws conclusions here regarding any remedy. For instance, when we were seeing methyl alcohol and Jamaica ginger cases in Baltimore, it seemed that pilocarpin was the only thing which did good, and that its effects were but

temporary. Later we found that these transient clearings and cloudings were part of the toxemia. Again, when a toxic agent is withdrawn, the natural tendency is toward cure. Recently a saloon keeper, with typical alcohol amblyopia, came under my care. I wanted him to go to bed and sweat. He said he could not leave his business, but would let whisky alone. He did so, and with no other treatment than abstinence and epsom salts improved in a week from 2/200 to 20/100. Such observations naturally tax one's faith in the efficacy of drugs reported to have brought about identical results. Still, I had another case this winter, a physician, 33

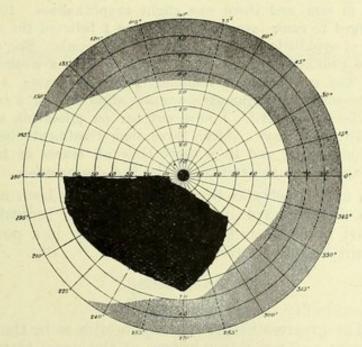


Figure 2.

years of age, with tobacco-alcohol blindness, who did not improve for three weeks at his home in a neighboring state under abstinence and strychnia. He had 10/200 when I saw him first, and when he returned for hospital treatment. In two weeks under pilocarpin sweats he improved to 20/40. He wrote me recently that he had stayed well. There is, I think, no doubt that diaphoresis is effective in eliminating toxic products, and its employment in toxic amblyopia is not only justifiable but imperative. The fact that some cases do well without it is no argument against its use. It only calls for more exact study of cases before we make up our minds what we have accomplished by treatment and what has gone on without our help.

While orbital lesions logically come under the class of cases apt to be helped by diaphoretic treatment, I do not know of any special reports. Orbital diseases are, I think, among our rare observations, and when they occur usually indicate some other line of treatment.

Last autumn a woman, 41 years of age, came to my clinic with a right subconjunctival ecchymosis of the lower cul-de-sac, It presented an appearance different from that usually seen, in that the blood formed a definite tumor. She had 20/30 vision. The fundus presented evidence of former disseminated choroiditis. There was no doubt of syphilitic infection. She was put on specific treatment, with heat locally, and instructed to return in two days. When she did the blood tumor was nearly double in size, and there was slight exophthalmos. She was now urged to come into the hospital, as I believed the case to be one of syphilitic disease of the orbital vessels. She did so, and the exhibition of mercurials and iodids for a week did no good. The exophthalmos remained about the same, and the blood beneath the conjunctiva was not absorbed. The external rectus became paretic. I now put her on pilocarpin sweats, given alternate days. After three such treatments improvement commenced, and in a short time all traces of trouble, including that in the rectus muscle, had disappeared.

The case illustrates what has frequently been noticed before, that in syphilis diaphoresis, when indicated by the part involved and symptoms present, is a powerful adjuvant to specific treatment.

CONCLUSIONS.

I would offer these conclusions:

1. The greatest utility of diaphoretics is in the acute congestive and exudative lesions of the uveal tract.

2. Diaphoretics are useful in retinal detachment produced by exudate from choroidal vessels during the course of acute choroidoretinitis. Judging from reported cases, they are also useful in the retinal detachment of high myopia. It is doubtful if restoration of function in the detached retina is usual or permanent.

 Diaphoretics are useful in alcohol-tobacco amblyopia and probably in other forms of toxic blindness.

4. Diaphoretics influence to a slight extent only, if at all, lesions of the cornea and sclera.

5. Diaphoretics are useless in atrophic and cicatricial lesions.

842 Park Avenue.

(18)

Diaphoretics and Diaphoresis in Ophthalmic Therapeutics.



T. A. WOODRUFF, M.D., Chicago.



DIAPHORETICS AND DIAPHORESIS IN OPHTHALMIC THERAPEUTICS.

T. A. WOODRUFF, M.D. chicago.

The enumeration of the more important points in treating pathologic conditions of the eye by means of sweat baths and the most successful means for their application are here attempted. As in other organs of the body, the complete performance of absorption and elimination are constantly going on in the eye without any disturbance of its other functions. When this fails to take place deleterious products accumulate in the vascular and lymphatic systems from the non-elimination of poisons or toxins and pathologic changes manifest themselves.

On what disturbing influences these ocular diseases depend we are still in a large percentage of cases somewhat in the dark. Although syphilis and rheumatism frequently act as predisposing causes they can not be held accountable for all; many of them are probably the result of defective metabolism obscure in origin.

The inflammatory affections, in which we may expect to derive the most satisfactory results from the use of diaphoretics, are those involving the uveal tract. This portion of the globe, by reason of its abundant blood supply, is prone to inflammatory and degenerative changes which show themselves in the form of an exudative inflammation beginning usually in the choroid and less frequently as a catarrhal inflammation of the ciliary body. An endeavor is made by these means to eliminate the toxic or infectious products on which the lesions probably depend. Although a history of syphilis, either hereditary or acquired, can in many cases be elicited, it is not here that our best results are obtained from the use of the sweat-bath alone. It is indicated in just such cases, in conjunction with mercury or potassium iodid, not only as an aid to the absorption of these drugs,

but by acting on the skin, helping in their elimination and rendering it possible to give much larger doses without experiencing their untoward effects. It is in those cases of exudative choroiditis which usually come on insidiously, without cause and in patients apparently in good health. The disease manifests itself by ciliary congestion without previous complaint from the patient, but on examination various changes are seen in the interior of the eyeball. The cornea is found to be hazy and on strong illumination Descemet's membrane is found to be covered with a number of opaque dots situated in its lower portion and arranged triangularly with the apex above. If seen in the early stages, and a view of the fundus can be obtained, a number of exudates can be seen situated in the choroid. The choroiditis is probably always the starting point of the uveitis, although in some cases the ciliary body seems to be the initial seat of the disease, beginning as a catarrhal inflammation of the glands situated in this region, according to Treacher Collins. Iritis is usually present, but in many cases is of the quiet variety, the pupil dilating readily with atropin and with little tendency to the formation of synechiæ. The exudates become more abundant until covering Descemet's membrane and rendering the aqueous and vitreous humor cloudy and of such a density that all view of the fundus is obscured. Later on, permanent opacities form in the vitreous and atrophic areas form in the choroid.

While sweating as a means of treating intraocular diseases has been advocated by a number of authorities, it is most useful in exudative inflammations and especially in those of recent occurrence. Diaphoresis by means of pilocarpin has been successfully employed by a number of men of good repute in the treatment of various intraocular affections, especially the inflammatory diseases of the uveal tract, while some few have reported cases in which marked benefit has been derived from such treatment. Among others of the earliest writers who advocate this method of treatment may be mentioned Weber, Scotti, Schmidt-Rimpler, Landsberg and deWecker,

^{1.} Weber: Centralblatt für Med. Wissenschaften, 1876.

Scotti: Berliner klin. Woch., 1877, No. 11.
 Schmidt Rimpler: Berliner klin. Woch., 1878, No. 24.

^{4.} M. Landsberg: Philadelphia Med. Times, 1878-9, vol. lx, pp. 345, 369.

deWecker: Graefe-Saemisch Handbuch der Gesammten Augenheilkunde der Ophthalmologie, vol. iv, No. 2.

who obtained favorable results, and in some cases where other remedies had failed, in cases of chorioretinitis with vitreous opacities, and recommended it as highly efficacious in the treatment of such disorders. Fuchs6 used the sweat bath promoted by pilocarpin for the absorption of serous as well as of organized fresh exudations, and reports having successfully treated several cases of detachment of the retina. In his experience it was ineffective in old opacities of the vitreous and in neuroretinitis. Of more recent date J. A. Spalding, Hansell, Burnham, de Schweinitz and myself have written of the advantages to be derived from the use of diaphoretics in the treatment of certain exudative intraocular inflammations and as an adjunct to other drugs, especially mercury and potassium iodid, and in the elimination of the toxic and infectious products on which these diseases probably depend.

Although sweating is a useful remedy in many inflammatory affections of the eveball, especially those of a low-grade character and those involving the internal structures of the globe, I by no means wish it to be understood that such affections are to be combated by this means alone, although a fair number of cases have been met with in which not only marked improvement has taken place without the use of any other medication, but the disease has been brought to a successful termination. In exudative choroiditis I have found diaphoresis usually assisted by the subcutaneous administration of pilocarpin hydrochlorate, very useful in the early stages before there is any involvement of the retina previous to the appearance of patches of atrophy, as in this advanced stage of the disease very little improvement of vision can be expected, but even then the further progress of the disease may be checked and useful vision be retained. It undoubtedly has a beneficial influence in the absorption of choroidal exudates and in allowing the affected tissues to resume their activity, and we can

^{6.} E. Fuchs: Wiener med. Woch., Nos. 37 and 38.

^{7.} J. A. Spalding: Arch. of Ophthalmology, April, 1892.

^{8.} Hansell: Ophthalmic Record, vol. vi, No. 12, p. 668; Philadelphia Polyclinic, Nov. 20, 1897.

^{9.} G. H. Burnham; Ophthalmic Review, 1897, vol. xli, p. 259;

Arch. Ophthal., 1898.

10. G. E. de Schweinitz: Therapeutic Gazette, 1892, vol. viii, p. 436; Ophthalmic Record, 1898, vol. vii, p. 85.

11. F. A. Woodruff: The Journal A. M. A., October, 1902.

safely encourage the patient in the hope of a favorable

termination of his symptoms.

In vitreous opacities very gratifying results can be obtained in many cases from the use of the sweat bath alone, the opacities becoming readily absorbed and the vitreous clearing up. In the recent cases, where the opacities are small, although the vitreous may be so cloudy that the details of the fundus are made out with difficulty and visual acuity is very much lowered, there is usually a rapid clearing up of the exudates and visual acuity, if not fully restored to normal, may be greatly improved, so that useful vision is obtained.

In cases of long standing and where the opacities appear as large, dark, irregular masses, the degeneration has been too extensive to expect much improvement from any treatment, and in such cases the prognosis is less favorable. In elderly people, even when the disease is of recent occurrence, the prognosis is not so favorable, still the progress of the degeneration may be checked and absorption of a considerable portion of the exudate take place with retention of a useful amount of visual acuity. It is in the young individual that most favorable results

are to be looked for.

In hemorrhage into the vitreous more favorable results are to be looked for where the extravasations are small, in which case complete absorption may take place. In the larger hemorrhages more permanent opacities are apt to remain in spite of treatment. In detachment of the retina I have not seen any favorable results from the use of diaphoretics.

In toxic amblyopia diaphoresis materially aids in the elimination of the toxic agent, but it is very difficult to estimate its true value as a curative agent, and as such

its value is very doubtful.

METHOD OF ADMINISTRATION.

As to the technic employed in getting the patient into a profuse perspiration, the baths should be given when the stomach is empty, as being less liable to produce any untoward effects, this being especially the case when pilocarpin is to asist in the production of the sweat. The patient should be in bed and wrapped up to the neck in a blanket and again covered with at least four blankets. Under the latter half a dozen quart bottles containing boiling hot water should be placed. If used at all, pilocarpin should now be given hypodermically,

beginning with one-tenth to one-eighth of a grain, the dose of which can be increased if considered necessary to produce a more profuse perspiration, but usually a larger amount of the drug is unnecessary and not at all essential to the success of the treatment. The patient is now given to drink at least a pint of hot water, weak, sour lemonade or tea. In a few minutes he should begin to break out into a profuse perspiration, which should continue for at least two hours, only stopping short of that time if he shows any bad symptoms. At the end of the sweat he should be thoroughly dried and the skin rubbed with alcohol and then allowed to rest the remainder of the day. This treatment should be continued at least every other day until twelve baths are taken. At an interval of two or three weeks a similar course of treatment should be repeated, and then continued at various intervals so long as necessary. It is important that the treatment be carried out systematically and at regular intervals if we desire to get results.

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DISCUSSION

ON PAPERS OF DRS. WOODS AND WOODRUFF.

Dr. W. B. Marple, New York City, agreed with Dr. Woods that if therapeutic nihilism is bad, undue therapeutic enthusiasm is worse. Dr. Marple said in regard to the use of diaphoretics that the unwillingness of patients to undertake the treatment often deters physicians from using it in what would be suitable cases. The practice of Dr. Kipp in this regard is a most excellent one. When he has a case where he thinks it indicated, instead of going through the troublesome methods in the hospital he sends the patient to a Turkish bath establishment, and Dr. Marple thinks that is a very good idea. Diaphoretics are useful especially in cases of disease of parts abundantly supplied with blood vessels; all forms of uveitis of an acute character. The more chronic conditions are not so much benefited. The unwillingness of the patients to subject themselves to the sweat-bath has led Dr. Marple to use the salicylates, and while the beneficial results may not be so great in this way, still they have a very useful action. He agreed that in most cases the withdrawal of the poison is the most important element, although he can readily see that the addition of diaphoretics may be of distinct advantage. He was recently interested in seeing a child who had been poisoned by instillation into the eyes of atropin drops. The child was violently delirious and it was not until it had been given a good sweat-bath that it quieted down and went to sleep.

Dr. Walter L. Pyle, Philadelphia, said that he is a firm believer in thermotherapy and in hydrotherapy, but he protested against the promiscuous employment of hypodermic injections of pilocarpin, and considers it a very dangerous procedure. He knows of one case in which the patient never recovered, and it seems to him that such a dangerous procedure should not be recommended. It is true that this patient had an advanced nephritis, but all these patients have either visceral disease or profound disturbances of the circulation or of metabolism. In his practice, to produce diaphoresis, he employs the Turkish bath, hot-water bottles, hot blankets, hot drinks, etc. There is one drug that he uses frequently—that is Dover's powder. He has never seen any bad results from it, and the patients all seem to do better when it is given. It has a quieting action that is beneficial. He is afraid of the massive doses

eral with Dr. Pyle concerning the dangerous possibilities of giving large doses of pilocarpin. A small tentative dose should be given at first, maybe not over a twelfth of a grain. Some patients are susceptible to the remedy and show marked reaction; others resist even large doses. Dr. Woods recently saw in consultation a young lady with acute otitis media, and was told that she had had no physiologic reaction from doses of a sixth, a quarter and a half grain. The patient's age is another consideration. The only serious depression Dr. Woods ever observed was in a man over 60 with organic heart disease, who never should have had the drug. Moderately severe vesical pains followed its use in another case, but these are the only instances of trouble Dr. Woods has observed. Dr. Pyle's method of using atropia in obstinate cases of iritis is most useful. Heat is certainly an adjuvant to atropia. Diaphoresis has not in Dr. Woods' experience helped senile or disseminated choroiditis. The exudative choroiditis, with deposits on the posterior surface of the cornea, so-called descemetitis, as described by Hills Griffith in Norris and Oliver's System, is the form of disease which is most benefited.

Dr. T. A. Woodruff, Chicago, said that he has never seen any bad effects from the hypodermic use of pilocarpin. He always gives small doses unless it is difficult to get the patient to sweat; then he increases the dose; generally gr. 1/10 to 1/8 is sufficient. He has found it unsatisfactory to give the patient the cabinet bath at home. In a hospital, with a nurse to handle the patient, good results may be obtained.

