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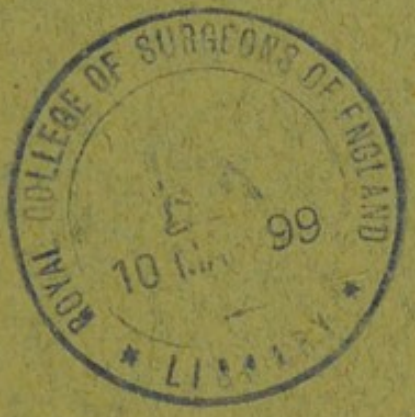

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HOLOCAIN IN OPHTHALMIC SURGERY; ITS SUPERIORITY OVER COCAINE; ITS THERAPEUTIC VALUE.

By HASKET DERBY, M.D., Boston.

THE new local anæsthetic, holocain, to which the writer called attention more than a year ago (*Boston Med. and Surg. Jour.*, June 3, 1897), has not yet come into very general use, judging from the little reference made to it in the medical press, as well as the indifference manifested by so many of those who have become habituated to the employment of cocaine. Believing as I do that the latter drug is in many important respects distinctly inferior to holocain, and having used the new agent almost exclusively for the past sixteen months, I have thought that a brief record of my own personal experience might not be without value.

In the operation for the extraction of senile cataract it is a most efficient anæsthetic. While not superior to cocaine in its superficial effect, it undoubtedly causes a greater degree of insensibility of the iris. Where a simple extraction is not performed and an iridectomy has to be done, we are all familiar with the start the patients may give, as well as the pain they complain of, at this stage of the operation. Under holocain, applied after the corneal cut has been made and the anterior chamber evacuated, it is my experience that the iris very generally allows itself to be seized with the forceps and excised without much if any suffering. This is a very great practical advantage. In connection with the operation of extraction, however, it is but fair to remark on the fact that the holocain does not control hemorrhage as cocaine does, and that where the latter agent is

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not used we are liable to meet with a troublesome amount of bleeding.

For the removal of a foreign body from the cornea, holocain is decidedly preferable to cocaine, as it neither affects the accommodation nor enlarges the pupil, thus rendering its use possible in the case of people with a tendency to increase of ocular tension. In other operations on the cornea or iris, such as that of Saemisch for ulcus serpens or iridectomy for glaucoma, it is a well known fact that a degree of inflammation that prevents the absorption of cocaine will often yield to holocain, thus rendering the use of ether or chloroform unnecessary. Had cocaine alone been at our command, general anæsthesia would have been the only resort.

In the various operations on the muscles of the eye, no local anæsthetic has been found to give entire satisfaction. It can only be claimed for holocain in this connection that it is at least as efficient as cocaine, and can be used in cases where distressing constitutional symptoms have been produced by the latter.

In probing the lacrymal passage I still make a preliminary injection of cocaine, the poisonous effects of holocain, when administered internally, rendering it unsuitable for such a purpose. For the same reason no subcutaneous injection of the drug can be made. But in the numerous cases where I have used it locally and superficially I have never seen the slightest general disturbance.

To sum up, then, the advantages of holocain over cocaine:

1. It does not cause mydriasis, and may therefore be used without danger of bringing about increase of tension.

2. It does not affect the accommodation.

3. It brings about a greater degree of anæsthesia of the iris than does cocaine.

4. In cases of severe and painful inflammation which resist cocaine, holocain often proves efficient.

5. Unless swallowed or injected subcutaneously it produces no constitutional effects.

6. It has no effect on the corneal epithelium.

7. It is strongly bactericidal in its action.

Per contra, cocaine distinctly reduces the tendency to

hemorrhage, and it can be injected into the lacrymal sac, and often subcutaneously, with comparative impunity.

Such being the facts, it would certainly seem that, in the great majority of cases, holocain should supersede cocaine as a local anæsthetic in ophthalmic surgery.

A single word in regard to eucaine, which has also been proposed as a substitute for cocaine. My opinion of its efficiency is based on the following occurrence. I had operated in January of the present year on a lady of eighty for the extraction of cataract. Holocain was used, and the operation passed off well, causing little or no pain. A month ago I undertook to remove the cataract on the second eye. My nurse, a graduate of the Infirmary Training-School, had been used to cocaine, and had never seen anything else employed at an extraction. I was pleased to be able to call her attention to the advantages of holocain, and promised her a proof of its anæsthetic value on the present occasion. Greatly to my mortification, as well as astonishment, the patient complained bitterly of the pain, and asked me after the operation why it hurt so much more than it did the first time. On my reaching home the mystery was explained. I had taken by mistake a bottle of a two-per-cent. solution of eucaine B, and had not noticed the substitution until my return.

But I have found a possible use for holocain that, as far as I am aware, has not yet been adverted to. It is based on its bactericidal properties, which were so carefully investigated by Heinz and Schlösser (*Klinische Monatsblätter*, Jahrg. xxxv., S. 117).

If the immediate cause of corneal ulceration is, in accordance with the present theory of suppuration, the invasion of the territory by micro-organisms (Fuchs); if the ulcus serpens arises through infection of the cornea by organisms which give rise to a purulent inflammation (Fuchs); if so severe a remedy as the actual cautery has sometimes been efficient in bringing about a cure, why may not germicidal action be induced through milder means than the application of a high degree of heat, or the clumsy and roundabout method of the subconjunctival injection of corrosive sublimate?

"On the development of bacteria," say Heinz and Schlösser (*loc. cit.*), "holocain exerts an energetic restrictive influence. A 0.1 per-cent. solution plainly retards putrefaction and fermentation; a half-per-cent. solution prevents any development of bacterial germs; multiplying fission fungi are killed by a one-per-cent. solution. One-per-cent. holocain is therefore an active antiseptic."

The use of holocain in ulcers of the cornea seemed to be sufficiently indicated by the foregoing, and I began to employ it during the past year. My observations have been limited in extent, but thus far they have gone to convince me that holocain has a therapeutic value previously unsuspected.

A middle-aged man, in good health, had been for three weeks under my care for progressive corneal ulcer. He had used pilocarpine, cocaine, atropine, fomentations, and the compressive bandage without benefit. The pain had become excessive and the process had begun to take on the character of an ulcus serpens. I had begun to entertain thoughts of Saemisch's operation or the application of the actual cautery. I applied holocain, which I had never before used in a similar case, with the idea of relieving the nocturnal pain. Employed at first in connection with the other remedies, it was finally used alone, an immediate improvement seeming to follow its application. In the course of ten days the cornea had almost entirely cleared and the patient was discharged. There has been no relapse.

Another patient, also a man of middle age, had been under my care since December 10, 1897, with small corneal ulcers. These were peripheric, involved but slight loss of substance, but were extremely painful and very obstinate, yielding but slowly to treatment and constantly recurring. Finally, June 12th, I applied holocain to relieve the pain. Three days later the patient was well. At a subsequent attack, he himself applied cocaine, with the result of distinctly aggravating all the symptoms. Holocain was then substituted, and the attack was cut short. In five days he was well, and has had no attack since June 21st.

My brother, Dr. R. H. Derby of New York, writes me as follows:

"In June last I had a case of purulent conjunctivitis that had been treated for three days with ice and nitrate of silver, the usual remedies. When I was called in, the conjunctival symptoms had largely abated. There was on the left cornea a central ulcer,

deep and threatening. The patient was a girl of sixteen and was found to have a leucorrheal discharge. The secretions from the eye had been examined twice, and the diagnosis of gonorrhœal ophthalmia had been made. I was told, however, that no gonococcus had been found. It was about that time that you wrote me of the value of holocain in cases of infected corneal ulcer. I made instillations of this drug, together with atropine and occasional warm compresses of camomile. The improvement in the corneal process was very rapid and the eye shows to-day a small central corneal macula, with a vision of ten-tenths."

For the following case I am indebted to Dr. Myles Standish of Boston, in whose practice it ocurred.

" Mrs. E. M. H., married, forty years old, came June 1, 1897, with two infiltrated ulcers of cornea in the right eye, pin-head in size, and at about the margin of its pupil when moderately dilated, also with a gray infiltration just below pupil in the left eye. The ulcerations failed to heal, did not greatly extend in area ; for several weeks new blebs appeared in each cornea which soon became ulcers, and about February 1, 1898, the ulcers increased in size on both corneæ. Patient up to this time had been treated with some antiseptic ointments, having for their active principle either the yellow oxide or the red iodide of mercury. Had also had atropine and at times pilocarpine and hot fomentations.

About February 5th patient was put on a solution of holocain and all other treatment omitted. There was immediate improvement, and new herpetic blebs ceased to appear. Eyes steadily improved. April 4th holocain was omitted, and on April 12th the patient returned with a new ulcer on the cornea of right, which did well when holocain was resumed. This experience was repeated on two subsequent occasions, and holocain was only finally omitted on June 15, 1898.

While so brief a series of cases conveys no certain proof of the value of holocain as a therapeutical agent, it distinctly encourages additional investigations in this direction.

That holocain has its limitations, even as an analgesic, is shown by my recent experience in a protracted and most painful case of double scleritis. While cocaine had absolutely no effect, holocain caused a disagreeable, burning sensation, lasting some hours after each application, and obliging its discontinuance. Relief was only obtained by leeching the temples and the use of fomentations.