

# *Eucaïne Hydrochlorate "A"*

(n-methyl-benzoyltetramethyl- $\mu$ -oxypiperidincarbonic acid-methylester.)

AND

# *Eucaïne Hydrochlorate "B"*

(benzoylvinyldiacetonalkamine.)

Many and very favorable reports upon EUCAINE have appeared during the first year of its introduction. A number of these we have reproduced in our pamphlets of October, 1896, and May, 1897. Further testimony from eminent authorities, showing conclusively its superiority over cocaine, have since appeared in American and foreign medical journals. We now take pleasure in submitting these to the profession, and we venture to express the hope that Eucaïne, the best and latest of the local anæsthetics, will be given a trial by those physicians who have not as yet had occasion to use it.

*From the University Clinic and Polyclinic for Diseases of the Eye, Berlin.*

## A FURTHER COMMUNICATION CONCERNING EUCAINE "B".

BY DR. P. SILEX,

Lecturer and First Assistant at the University Ophthalmological Clinic at Berlin.

*(Therapeutische Monatshefte, Berlin, June, 1897.)*

The number of the favorable reports upon Eucaïne "A" during the last few months have been very great. Disadvantageous features have rarely been noticed. Amongst the least laudatory reports we may mention those of Vollert (1), Best (2), and Winterfeld (3); and they perhaps would not have appeared if these investigators had not used such concentrated solutions of the drug. It is possible also that the purity of the Eucaïne "A" may not have been above cavil. I believe this latter to be the case for the following reasons:

Dr. Vinci entered the polyclinic of Geheimrath Professor Schweigger about a year ago, and, with his permission, began these investigations, in conjunction with myself, which included observations upon eyes affected with the most varied diseases. My independent investigations enabled me to inform him that Eucaïne "A" was very useful, and fully equal to cocaine. A solution that I received from elsewhere later, and which was labelled Eucaïne "A", I was compelled to reject; for it caused severe pain in the lids and great reddening of the conjunctiva. This fact is mentioned in my article (4). I am somewhat at odds with Dr. Vinci as to the explanation of the phenomena observed with him.

- (1). Münch. med. Wochenschrift, 1896, No. 22.
  - (2). Deutsche med. Wochenschrift, 1896, No. 36.
  - (3). Münch. med. Wochenschrift, 1896, Dec. 22.
  - (4). Deutsche med. Wochenschrift, 1897, No. 6.
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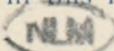
The same care and zeal was observed in both sets of cases, and the clinical material was not different; and I therefore conclude that the solutions of Eucaine "A" were not alike, that one of them was perhaps not free from acids or other impurities. Dr. Vinci is certainly right when he reports that the results obtained at the clinic were good ones. And I do not attempt to deny the occurrence of the unpleasant phenomena that appeared after the employment of the solution that we were using later.

I am now in a position to report further good results with Eucaine "B". For the last two and a half months it has been used by **Professor Schweigger** in eye operations of the most varied kinds, including 49 senile cataracts, and with perfect satisfaction.

The anæsthesia was complete, the vascular injection moderate. Corneal opacities did not appear; but it is important not to make the instillation too long before the time of operation. Four drops are sufficient, instilled five minutes before commencing work. Repeated and lengthy instillations of the 2 per cent. solution that is usually employed cause a considerable injection of the conjunctival vessels, and on section of the conjunctiva, the abnormal hemorrhage may interfere with our sight of the field of operation. It is not yet decided whether the hyperemia exercises any favorable influence upon the healing of the wound. Mellinger attributes to the cocaine anæmia an unfavorable effect in this respect.

When for any reason it becomes necessary to anæsthetize the iris, which cannot be effected by the instillation of either cocaine or Eucaine into the conjunctival sac, a few drops of the Eucaine solution must be injected into the anterior chamber with a broad-mouthed pipette after the corneal section has been made. In two minutes, at the latest, thereafter, the iris is anæsthetic; a fact of which I have fully convinced myself by experimentation upon two rabbits, as well as in the case of one man affected with cataract.

I shall not expatiate upon the other ocular phenomena occasioned by Eucaine "B", as I have nothing new to report thereon. I shall only remark that *in squint operations its action was really marvelous*, and that in this field cocaine is not to be compared with it.



## EUCAINE "B"—A FURTHER NOTE ON NEW LOCAL ANÆSTHETICS.

BY J. C. CLEMESHA, M. D., L. R. C. P., LONDON,  
M. R. C. S., ENGLAND.

(*Buffalo Medical Journal*, June, 1897.)

One evening in September of last year I read a short paper entitled "Eucaine—a note on the new local anæsthetic", before the Surgical Section of the Buffalo Academy of Medicine, describing the properties of the new discovery, and its advantages and disadvantages in ophthalmic practice as compared with cocaine.

The most serious objection to the use of Eucaine solutions lay in their irritating properties when instilled in the eye, the conjunctiva becoming markedly hyperæmic and the patient complaining of a smarting, pricking sensation lasting some minutes.

Gradually Eucaine was less and less frequently used at the Buffalo Eye and Ear Infirmary, wholly, I believe, on account of the above-mentioned symptoms ; until at last it was employed merely to demonstrate its anæsthetic properties to the medical students of the University of Buffalo attending Dr. Howe's clinic.

Lately, however, Professor Merling, of Berlin, has produced, synthetically, a new substance which, under the name of Eucaine "B", is said to possess all the desirable properties of Eucaine "A", minus its irritating and congestive effects.

Briefly stated, Eucaine "B" is the hydrochlorate of benzoyl-vinyldiacetonalkamine and closely related not only to the older Eucaine "A", but also to cocaine, and especially to tropacocaine. It is, however, less toxic than the latter drugs, and its solutions may be sterilized by boiling. It is soluble in warm water to the extent of 5 per cent., and, physiologically considered, its main difference from Eucaine "A" is that its irritant effects are minimal.

Being interested to personally investigate the action of this new substance, a 2 and 5 per cent. solution were procured and their action contrasted with similar solutions of cocaine. First, three drops of a Eucaine "B" 2 per cent. solution were instilled in my right eye, and three drops of a cocaine 2 per cent. solution in my left. The Eucaine "B" caused a passing, burning sensation, more noticeable than that produced by the cocaine, though there was an absence of that peculiar stiffness experienced in the cocainized eye. The degree of anæsthesia produced was about alike in either eye, though it took longer for the Eucaine "B" to bring about its effect; and while the pupil of the left eye became dilated from the cocaine solution, that of the right eye remained stationary. Furthermore, there was no congestion of the conjunctiva, which would surely have followed the instillation of a 2 per cent. Eucaine "A" solution.

After this preliminary experiment upon myself I employed the Eucaine "B" solution in three lachrymal cases and noted that the patients remarked that the drops caused more smarting than the ones used on former occasions, *i. e.*, cocaine, but that it was merely transitory, a passing unpleasantness. The Eucaine "B" solution produced a satisfactory anæsthesia, and slight, if any, congestion of the conjunctiva; the cornea remained clear and did not show that roughness or shriveled appearance seen after the application of cocaine.

Later, **Dr. Howe** did an iridectomy. In this case six drops of a 5 per cent. solution of Eucaine "B", one drop at intervals of two minutes, produced a successful anæsthetic state, although the patient claimed that she felt the operation more than she did a similar one on the other eye, performed under the effect of

cocaine; but it must be stated that in the former iridectomy ten drops of a 5 per cent. cocaine solution were the means by which the state of local anæsthesia was brought about. There was no noticeable irritation or injection of the conjunctiva; and beyond a preliminary smarting no uncomfortable effects were observed.

In three patients with steel imbedded in the cornea, a 2 per cent. solution of Eucaine "B" was used as a preliminary measure to removing the foreign bodies. In all cases the anæsthesia was satisfactory, though not induced as quickly as that from cocaine. There certainly was no dilatation of the pupils that was appreciable, though there was hyperæmia of the conjunctiva and slight smarting when the solution was first instilled into the conjunctival cul-de-sac.

The following conclusions, I think, may be drawn from the above cases: Eucaine "B" is an efficient local anæsthetic and may be substituted for cocaine. It causes slightly more smarting upon application, and appears somewhat slower in producing anæsthesia than cocaine. *It does not dilate the pupil or cause cloudiness of the cornea as does cocaine.* It does not irritate the conjunctiva or cause hyperæmia, as does Eucaine "A", but, like it, can be sterilized by boiling and will keep for long periods.

As a result of some observations in nose and throat cases, **Dr. Millener** suggests that, while Eucaine "B" produces a similar state of anæsthesia to Eucaine "A" and cocaine, it does not cause the irritation and congestion of the parts like the former, and is slower in its action than the latter. It is intensely bitter to the taste and not as soluble as Eucaine "A". And whereas Eucaine "A", when applied to the mucous membrane of the nasal cavities, causes a burning sensation and a slight watery discharge due to its irritative properties, Eucaine "B" does neither.

The hemorrhage resulting from a nasal operation, using Eucaine "B", is not greater than one done under the effect of cocaine, though in the latter the hemorrhage may be delayed, due to the primary anæmia of the parts; and perhaps the tendency to hemorrhage is less, as the subsequent dilatation of the vessels when cocaine is used often causes profuse and prolonged bleeding, while in Eucaine "B", though at first dilatation of the vessels is present, the secondary effect is that of constriction of the capillaries and cessation of the hemorrhage.

In a case of hypertrophic catarrh, Dr. Millener removed the hypertrophied portions of the lower turbinate on the left side, using a 5 per cent. Eucaine "B" solution as the local anæsthetic. Anæsthesia was complete in six minutes. There was no apparent congestion of the parts and the bleeding, though severe for a minute or so, ceased quickly.

On the right side, same case, in removing a similar sized hypertrophied turbinate, Eucaine "A" was used; and it was noted that though much congestion ensued on application of the solution, the subsequent hemorrhage was not at all severe.

## EUCAINE "B" AS A LOCAL ANÆSTHETIC IN SURGERY.

BY DR. LOHMANN, BERLIN.

(*Therapeutische Monatshefte* No. 8, August, 1897, p. 427.)

At the suggestion of Dr. Thomalla, Surgeon-in-Chief of Accident Station No. VI, I now proceed to publish the results that we have obtained from the use of Eucaine "B" as an anæsthetic in the domain of surgery. Quite early in our experience with the drug we abandoned the use of the weaker (3 per cent.) solutions, whose action was not satisfactory, and employed 10 per cent. solutions, with which we obtained most excellent results. We had occasion to employ the anæsthetic in this concentration for the opening of abscesses and the incision of carbuncles, inflammations of the cellular tissue, of the tendinous sheaths, in the suture of tendons, in the removal of a great number of foreign bodies, and for the exarticulation of digits.

In the treatment of the abscesses and carbuncles we injected one to two hypodermic syringefuls (15 to 30 minims) of the 10 per cent. solution; and we could then quietly and without any pain make the necessary incisions and curettings. The same amount of the anæsthetic was employed for the painless operation of small abscesses; for the larger ones three to four syringefuls were needed. We are fully convinced that any abscess at all can be opened painlessly under Eucaine anæsthesia; for as much as 3 grms. (45 grains), equalling 30 syringefuls of the 10 per cent. solution may be injected in the adult without any fear of causing toxic symptoms.

Among the many foreign body extractions that were done under Eucaine "B", I may be permitted to mention a very characteristic one more in detail. A needle had penetrated the foot of a girl ten years of age and had been broken off, leaving the point, about 2cm. ( $\frac{7}{8}$  inch) long, imbedded in the tissues. The needle had entered the foot at the dorsum; its point lay under the fasciæ, deep down in the foot. From three-quarters of an hour to an hour were required to locate and extract the needle. After the use of a single syringeful of the 10 per cent. solution both operations could be quietly done. Only towards the end of the operation did the patient show slight sensibility.

In the exarticulation of the fingers from one to two syringefuls of the solution were sufficient. The first case of this kind was that of a thirteen-year-old boy, in whom we exarticulated between the first and second phalanx of the third, and the second and third phalanx of the fourth fingers. For both digits we used about  $1\frac{1}{4}$  syringefuls; about  $\frac{3}{4}$  of a syringeful upon the flexor and  $\frac{1}{2}$  a syringeful upon the extensor surfaces. When we commenced to operate, after the lapse of about a minute, the boy complained somewhat; but by pricking the finger with a needle, which the boy did not feel at all, we soon convinced ourselves that his cries were not caused by pain. When the boy's face was covered both exarticulations were done without further dis-

turbance. Another boy, in whom an exarticulation was done under the influence of about  $1\frac{1}{2}$  syringefuls of the 10 per cent. Eucaine solution cried dreadfully when the first dressing was removed about a week after the operation, though he had been entirely quiet during the surgical procedure itself.

A third and very instructive case deserves to be mentioned. A factory operative twenty years old had received a severe contusion of the second, third, and fourth fingers of the left hand. The exarticulation of the terminal phalanx of the index finger, and the amputation of the middle finger were indicated; on the ring finger only the nail was destroyed, being almost torn off. I injected into the index finger about  $1\frac{1}{2}$  syringefuls of a 10 per cent. Eucaine "B" solution, using 1 syringeful for the flexor and  $\frac{1}{2}$  a syringeful for the extensor surfaces of the second phalanx; the same amount was similarly employed for the middle finger; and the ring finger received  $\frac{1}{2}$  a syringeful. During the operation, which was begun about a minute after the injection, the patient complained of at first slight and later more violent pains in the ring finger, which was the one less severely injured, and had received only  $\frac{1}{2}$  a syringeful of the solution. In both the other fingers there was not the slightest pain during the operation.

In none of our cases did we see any unpleasant by-effects or toxic symptoms. In regard to the statement in the "Bulletin Médical", 1897, No. 47, that "Eucaine 'B' is much less toxic than Eucaine 'A'; as a local anæsthetic Eucaine has been found to be greatly inferior to cocaine." I can only repeat that my experience shows that Eucaine "B" in 10 per cent. solution is much more powerful in its action than cocaine and the other older local anæsthetics.

In view of all its advantages, besides the above-mentioned ones, its non-decomposition under sterilization, and also because of its favorable and very satisfactory action, Eucaine "B" deserves to be more generally employed in surgery. We cannot recommend it too warmly to the profession in general, and more especially to the country practitioner, whom it will help over many difficulties.

## A CONTRIBUTION TO THE STUDY OF ANÆSTHESIA IN OCULAR SURGERY BY MEANS OF EUCAINE "B".

*Abstract of thesis for the Doctorate in Medicine presented to the Faculty of Medicine of Paris, April 8th, 1897, by PIERRE DOLBEAU.*

Dolbeau has made an exhaustive study, embodied in a 62-page pamphlet, of the properties of Eucaine "B", more especially as compared with those of cocaine. As regards the toxicity of the new anæsthetic, subcutaneous experiments upon rabbits to the number of 19 showed that while the accidents occurring with cocaine were serious, those occurring with a solution of Eucaine "B" of similar strength were far less grave, and rapidly passed off; and that, to obtain the same unpleasant effects in animals of

similar size, it was necessary to employ a considerably greater quantity of Eucaine.

In respect to its action upon the vessels, similar operations done upon rabbits under the two anæsthetics showed that there was considerably more hemorrhage with Eucaine than with cocaine. This vas-dilator action was apparent in instillations into the human eye and that of animals, as well as in operations on the eyes of rabbits. The author concludes that Eucaine "B" has the same action in this respect as Eucaine "A", and that it would be inconvenient in operations upon the conjunctiva, the ocular muscles, and the eye-lids.

The analgesic action of Eucaine "B" Dolbeau finds to be quite as great as that of cocaine. It set in after instillations as promptly as with cocaine, and its duration was from 25 to 35 minutes, as against 40 to 45 minutes for cocaine. He notes, as Panas has remarked with cocaine, that the insensibility of the mucosa stops quite suddenly at the posterior lip of the free borders of the eyelids. As regards the extension of the anæsthesia to the deeper parts of the eye, the author does not consider his experiments conclusive; nevertheless, he was able to do an iridectomy, and a section of a right external muscle, after a sub-conjunctival injection, without the animal manifesting the least sensibility.

It is a well-known fact that cocaine has little action, and often none at all, upon inflamed eyes. Dolbeau found that Eucaine "B" caused an anæsthesia as rapid and complete in a rabbit's eye, the cornea and conjunctiva of which had been irritated by repeated curetting, as in the healthy eye, provided the inflammation was recent and slight. But twelve hours later, when the inflammation was more pronounced, he could obtain only a very imperfect anæsthesia. He also found that in the human subject, in cases of foreign body, and of granular conjunctivitis treated with scarification or grattage, the anæsthetization of the inflamed eye with Eucaine "B" was not always satisfactory. The cases where good anæsthesia was obtained were those in which the inflammation was slight. Cases of old granulations stood vigorous interference well under Eucaine "B"; but such granulations are said to be often painless. He concludes that the anæsthesia obtained in the non-inflamed eye is as complete as that from cocaine, and that, in the inflamed eye, like cocaine, its action is uncertain.

The author has also made a series of experiments as regards the burning that is said to occur with Eucaine "A". In animals the sole manifestation of the disagreeable sensation is the closing of the lids; and he has observed that rabbits keep the Eucained eye half closed, while that treated with cocaine is held open. In the human subject he found that the instillation of Eucaine "B" caused a mild sensation of burning, which disappeared very rapidly; whilst cocaine produced a persistent discomfort. Some patients did not feel this burning at all; and in those that did, it disappeared rapidly. It was nothing like the violent burning

caused by Eucaine "A". His observations were not sufficiently numerous to enable him to judge whether the pain was greater or more frequent in inflamed eyes; but he does not consider this point of importance, on account of the fugacity of the symptom.

Cloudiness of the corneal epithelium is of frequent, though not of constant, occurrence.

The author then turns his attention to the dilatation of the pupil, so disagreeable to both patient and operator after the cocaine anæsthesia. The paralysis of accommodation, and photophobia may last 24 hours or more; and the thick and plicated iris is difficult to avoid in extracting the crystalline lens. This is a serious drawback to the use of cocaine. Eucaine "B" does not dilate the pupil to any appreciable extent. In the great majority of cases it does not do so at all; and in the small minority where it seems to occur, the dilation is so very slight that it is hardly measurable and entirely unimportant.

A number of experiments were also made as regards the effect of the drug upon the intraocular tension. These were not quite conclusive, on account of the difficulty of estimating small variations of tension. But Dolbeau concludes that, with the greatest probability, the modification of ocular tension produced by Eucaine is much less than that caused by cocaine. This is an important argument in favor of that anæsthetic; for the hypotonia caused by cocaine is a great obstacle to its employment in ophthalmology.

These various conclusions were corroborated by eight observations made upon human subjects suffering from various affections of the eyes. The author's conclusions are:

1. Eucaine "B" is much safer than cocaine when injected into the subcutaneous cellular tissue.

2. Eucaine "B", like Eucaine "A", has vaso-dilator properties that may be inconvenient.

3. Eucaine "B" is a good local anæsthetic. In the non-inflamed eye it produces an anæsthesia as completely and as rapidly as cocaine does, but lasting perhaps a little shorter time. As in the case with cocaine, its action upon the inflamed eye is uncertain, and not to be counted on.

4. Eucaine "B" instilled into the eye sometimes causes a mild and fugitive burning sensation. It seems to irritate the conjunctiva a little, and sometimes causes cloudiness of the cornea.

5. Eucaine "B" does not dilate the pupil at all, or only to an absolutely insignificant extent.

6. Eucaine "B" seems to have no effect upon the intraocular tension.

**Prof. Bergmeister**, of Vienna, expresses himself as extremely satisfied with the employment of Eucaine in the Rudolfsburg Eye Clinic, saying:

"I have employed a 2 per cent. solution of Eucaine hydrochlorate for considerable time with great success in anæsthetizing the eye, especially for the removal of foreign bodies. The local

superficial anæsthesia of the conjunctival sac and cornea develops promptly, and no evil results whatever have been observed."—(*The Therapist*, London, July 15, 1897.)

## EUCAINE HYDROCHLORATE "A" IN MINOR SURGERY.

We quote the following from "Class-Room Notes", *Dunglison's College and Clinical Record*, February, 1897 :

"Since the introduction of Eucaïne Hydrochlorate into the Out-patient Surgical Department of the Jefferson Hospital, cocaine has been placed on the shelf.\* At one time this department used cocaine quite extensively as the means of inducing local anæsthesia; but alarming symptoms from its use in some of the cases caused its banishment, and not a drop of cocaine solution has been used in this department since last July. **Prof. Brinton** admires Eucaïne Hydrochlorate because it is rapid in action, safe, produces positive and prolonged anæsthesia, and causes no serious after-effects. He never misses a chance to use it in minor surgical operations before the class. In minor operations, such as the removal of a toenail or small tumors, the amputation of a finger or a toe, the extraction of a splinter, etc., he recommends the use of from 1 to 2 drachms of a 5 per cent. solution hypodermically, and insists on waiting five minutes after the injection is made for complete anæsthesia. Last month, **Dr. J. Chalmers Da Costa** operated on a case of Albert's disease (bursitis of the retrocalcaneal bursa and periostitis at the insertion of the tendo-Achilles). The operation consisted of incision of the bursa, removal of osteophytes from the os calcis, curetting of the bursal sac, etc., and closure of the wound with four stitches. The operation was entirely painless and made a good impression on the class."

**Dr. G. W. Crile** reported at the Cleveland Medical Society, May 14, 1897, an interesting case, "Obliteration of the Stomach, due to Carcinoma—Duodenostomy under Eucaïne" (*Cleveland Journal of Medicine*, June, 1897) :

"The amount of Eucaïne used in performing the operation was about two drachms of the 2 per cent. solution. The operation was practically painless. The incision was, perhaps, three or four inches long, to give room for manipulation. The doctor concludes that Eucaïne is certainly an efficient anæsthetic. He has performed quite extensive operations under Eucaïne, and thinks it is, as a rule, used in solutions stronger than necessary. He now uses  $\frac{1}{2}$  per cent. solution instead of 2 per cent. Its effect is about the same as cocaine applied locally. Eucaïne is a little slower in its action, the effect of the two remaining about an equal time. Eucaïne is not poisonous in such small doses as is cocaine."

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\*Dr. G. W. Spencer (J. M. C., 1892) has written two interesting papers on Eucaïne. The first paper was published in the November number of the *University Medical Magazine*. The second paper was published in the *Medical and Surgical Reporter*, November 28, 1896.

## EUCAINE AS A LOCAL ANÆSTHETIC IN URINARY ORGANS.

BY DR. WOSSIDLO.

The well-known unpleasant and sometimes dangerous by-effects of cocaine induced the author to substitute Eucaine in urological practice. For the purpose of urethroscopy and urethral dilatations he injected 15 to 30 minims of a 4 per cent. solution of Eucaine, according to Oberländer's method. In every case an anæsthesia equal to that produced by cocaine resulted, and no by-effects whatever were observed. Dr. Wossidlo's experience was so contrary to Görl's, who stated last year that his patients complained of a violent burning sensation, that the author wrote to Görl, who replied that on former occasions he had not a pure preparation of Eucaine, and that now he likewise observed no drawbacks to the use of Eucaine. Further trials convinced Dr. Wossidlo that 2 per cent. solutions of Eucaine are strong enough for all endo-urethral operations. This opinion was formed whilst employing the drug in cystoscopy; and, consequently, he is able to recommend Eucaine for the local anæsthesia of the urinary canal.—(*Centralblatt f. die Krankheiten der Harn-und Sexualorgane.*—*The Therapist*, London, August 15, 1897.)

## EUCAINE IN THE SURGERY OF THE GENITO-URINARY APPARATUS.

BY J. H. SCHALL, M. D.,

House Surgeon of the Hahnemann Hospital.

(*Abstracted from Medical Times, New York, May, 1897.*)

In consequence of my unfavorable experience with cocaine I have banished it as a means of local anæsthesia. A substitute for it I have found in a recently introduced drug known as Eucaine. Since very few reports of the use of Eucaine in genito-urinary surgery have come to my notice, I think the following case will prove interesting solely from the fact that it is the first of the kind, as far as I am aware, in which Eucaine was employed as an anæsthetic.

On March 19th last, Mr. S. M., merchant, thirty years of age, came to me with the following history. Eight years ago he had experienced an attack of retention of urine, which was relieved by a small catheter. From that time he has complained of frequency in micturition, the frequency being worse during the day. He has noticed a change in the character of his stream, which is frequently double, or spray-like. Dribbling after urination has annoyed him very much.

Examination showed the external genito-urinary apparatus atrophied, the penis in a flaccid condition. In attempting to explore the urethra no steel sound or ordinary soft instrument could be made to pass the stricture, which was located a little behind the bulbo-membranous urethra; but by persevering with filiform bougies I succeeded in passing one into the bladder.

The patient being advised to undergo an operation for the relief of his condition finally consented, providing a general anæsthetic should not be used. Having been favorably impressed with the use of Eucaine in producing local anæsthesia in previous minor operations, I concluded to try it in this case.

The patient being placed in the lithotomy position, the urethra was cleansed with a weak solution of potassium permanganate (1 in 2000), after which a filiform was introduced into the bladder. The perineum having been prepared in the usual manner, a sterile 4 per cent. solution of Eucaine was injected into the raphæ. After superficial anæsthesia was produced, the needle was introduced deep into the perineal tissues, and about one-half a drachm deposited immediately in front of the urethra. Using the filiform as a guide, an incision was made in the median line of the perineum two inches long, cutting through layer after layer till the knife point entered the urethra, exposing to view the filiform. The division being made with little or no pain, I then introduced a grooved director, and, inserting a probe-pointed bistoury along it, incised the dense cicatricial tissue for fully a half-inch.

The whole operation required three drachms of the 4 per cent. solution of Eucaine. There was no complaint of any marked pain subsequent to the anæsthesia, and as I left him the patient expressed himself as feeling "fine." The temperature rose to 100° F. on the afternoon following the operation, after which it ranged between normal and 99°. His urine, over which he had control, was passed entirely through the perineal opening for the first ten days, after which it began to find its way through the anterior canal. Twelve days afterwards the perineal wound had entirely closed, and the patient passed water freely through the urethra.

The result of this operation under Eucaine proved, to my mind, highly satisfactory.

## THE ASSOCIATED USE OF COCAINE AND EUCAINE.

**Dr. Hackenbruch** (cited in the *Wiener medizinische Blätter* for July 22) recommends the use of a solution of equal parts of cocaine hydrochlorate and Eucaine hydrochlorate as a local anæsthetic. The combination, he says, is not less efficient than cocaine alone, and is less poisonous. — (*New York Medical Journal*, August 21, 1897.)

## A CONTRIBUTION CONCERNING EUCAINE "A". BY DR. E. VOGT.

(*Société de thérapeutique, Paris, meeting of Feb. 11, 1897.*)  
(*La médecine moderne 1897, No. 13.*)

Dr. Vogt affirms that the communication of Pouchet leads to conclusions which are entirely contrary to the results obtained in clinical work. All the authorities who have tried Eucaine have

observed, 1: that it is less poisonous than cocaine, and, 2: that it causes no syncopal or emetic symptoms. Besides, Eucaine causes a hyperæmia of the tissues instead of the ischemia effected by cocaine, and this property of Eucaine is very useful in certain cases. The upshot of the matter is that Eucaine and cocaine have each their special indications.

## EUCAINE IN VETERINARY SURGERY.

Dr. Hobday (*Jour. Comp. Path. and Therap.*, March 29, 1897) states that in the clinic of the veterinary college Eucaine has been used in some forty cases, some of them being of a nature especially favorable for making a comparison between the action of that drug and cocaine. The results have been to confirm the view that the toxic dose of Eucaine is somewhat larger than that of cocaine, and at the same time that for operation on the cornea Eucaine compares very favorably with cocaine, although anæsthesia is not produced quite so rapidly. But as regards its local anæsthetic effects when injected subcutaneously or applied locally to parts other than the eye, the results obtained in the horse, dog, and cat, have not by any means equalled the results obtained with cocaine. Hobday and his colleagues have found, however, that a mixture of cocaine and Eucaine dissolved in water possesses the better anæsthetic properties of the cocaine solution and can be tolerated in larger dose than cocaine alone. A number of illustrative cases of operations on animals are given, and the conclusion is arrived at that in regard to the amount of Eucaine that can be used subcutaneously with safety, the limit of safety in the case of the cat and dog is about one-fifth of a grain to each pound of bodyweight; in the horse there is little likelihood of a case arising in which more than 20 grains will be required. Four grains of Eucaine produced toxic symptoms in a dog of 12 pounds weight; but the animal eventually recovered, whereas such a dose of cocaine would certainly have caused death. Again, a dog of 35 pounds weight received 8 grains subcutaneously without producing any very noticeable symptoms. In a cat in which local anæsthesia was attempted by 1 grain of Eucaine in solution no toxic symptoms followed; but by a mistake a couple of days later a grain of cocaine produced in the same animal toxic symptoms and death. The toxic symptoms are not noticeable so rapidly as with cocaine; hyperæsthesia is present, but not to such an extent; the rectal temperature rises; salivation takes place; but not so thin and watery as with cocaine, and the gulping movements are not so well marked. Similar clonic involuntary spasms take place as with cocaine, but at much longer intervals, and the animal becomes prostrated; respiration is accelerated; in the cat the pupil certainly becomes widely dilated; consciousness is not lost until shortly before death; and there is not the same peculiar quietness and absence of moaning which is so characteristic of cocaine. In one case death appeared to occur from cardiac failure, as there were a few distinct respiratory efforts after the heart had

ceased. *Post-mortem* appearances show nothing very pathognomonic; if examination take place within a short time after death the back of the pharynx, œsophagus, and in some cases the stomach as well, are found full of frothy mucus; but if the *post-mortem* examination be delayed some hours, even this will have disappeared.—*British Medical Journal*, June 5, 1897.

## EUCAINE IN DENTISTRY.

We quote the following from an article on "Dental Remedies", by **Dr. C. G. Edwards**, Louisville, Ky., read before the Kentucky State Dental Association, June 16th, 1897 (*Items of Interest*, August, 1897) :

"The public attention which has been attracted to cocaine renders it unnecessary for me to notice it here except as compared with a new and rival substance called Eucaine. While cocaine is an alkaloid of the leaves of coca, Eucaine is an artificial or chemical product. There is little chemical difference between the two substances, the only important physiological and therapeutic action being the difference in their toxic effect. I have used Eucaine for more than six months, and have extracted more teeth in that time than I had for several years previously. I extracted nine and eleven teeth, respectively, for two patients at one sitting, using two syringefuls on each subject, one of whom was a lady of highly nervous temperament and light weight. The strength of the solution was five per cent. No unpleasant or toxic effect was noticed, and no complaint was expressed by the patient.

Another advantage which Eucaine possesses over cocaine, is the greater permanence of the solution; and while cocaine is decomposed by boiling the solution for sterilization, Eucaine is not. I have kept a solution of the latter for two months and found it as energetic as when freshly made, though in every instance I boil it before using. In reading very many recent reports, from the pen of general and dental surgeons, I find expressed a universal and positive opinion in favor of Eucaine, as to its equal efficiency with cocaine in pain-obtunding power, and its very decided freedom from the toxic effects so frequently occurring with the older drug. The only unpleasant effect so far noticed, is swelling or puffing of the tissues, in some cases extending to the cheek or lip; this is unaccompanied by pain or inflammation, and subsides in twenty-four hours."

## LETTERS FROM AMERICAN DENTISTS.

**Dr. E. J. Adams**, Dentist, Magog, Que., writes under date of August 17th, 1897, as follows: "I have tried Eucaine, and am delighted with the same."

**Dr. John D. Bentley**, Dentist, 727 Main St., Willimantic, Conn., writes under date of August 10th, 1897: "The Eucaine received from you has given great satisfaction."

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**John H. Bird, D.D.S.**, Hudson, Mich., writes under date of August 5th, 1897: "It would be impossible for me to do without Eucaine."

**Dr. D. L. Boozer, Jr.**, Dentist, Newberry, S. C., writes under date of June 2nd, 1897: "I have given Eucaine a thorough trial, and am now using it in my practice daily with results entirely satisfactory, both to myself and patients. I have discarded cocaine entirely on account of the alarming symptoms sometimes attending its use."

**Jno. E. Clark, D.D.S.**, Elizabeth, Ill., writes under date of July 26th, 1897: "I find Eucaine Hydrochlorate very satisfactory indeed—so much so that I have given up the use of cocaine entirely."

**J. Walton Dace, D.D.S.**, Winchester, Ill., writes under date of June 12th, 1897: "The Eucaine I received from you gave excellent results."

**Dr. L. M. Grey**, Dentist, 108 Lexington Ave., Columbus, Ohio, writes under date of June 21st, 1897: "After having used cocaine eight years, to-day I discard it forever, with the perfect confidence that Eucaine Hydrochlorate is ten times the better anæsthetic."

**G. E. Hathorne, D.D.S.**, 206 Water St., Augusta, Me., writes under date of June 10th, 1897: "I am more than pleased with the results I am getting with Eucaine, and it is fast taking the place of all other anæsthetics in my practice."

**R. H. Hodgen, D.D.S.**, New York Dental Parlors, 61 E. Main St., Lexington, Ky., writes under date of June 14th, 1897: "I have no œdema, nor other unpleasant results from the 5 per cent. solution of Eucaine Hydrochlorate in extracting. I have extracted over 500 teeth, using Eucaine as a local anæsthetic, and am highly pleased."

**J. S. Hussey, D.D.S.**, 120 East Main St., Madison, Ind., writes under date of June 22d, 1897: "I have had good results from the use of Eucaine Hydrochlorate."

**Dr. W. B. Isenberg**, Dentist, Skaron, Pa., writes under date of June 2d, 1897: "I have had good success with Eucaine Hydrochlorate."

**Dr. Grafton Munroe**, Dentist, Springfield, Ill., writes under date of August 25th, 1897: "I am well pleased with the Hydrochlorate of Eucaine you supplied to me."

**J. W. Murrelle, D.D.S.**, Athens, Bradford Co., Pa., writes under date of August 19th, 1897: "Have been using cocaine ten years for extraction, but think now I shall use Eucaine altogether in the future."

**Dr. J. R. Pennington**, Dentist, 112½ W. Second St., Portsmouth, Ohio, writes under date of June 8th, 1897: "I have used Eucaine with perfect results."

**F. M. Poulson, D.D.S.**, 613 Second Ave., Lansingburgh, N. Y., writes under date of June 1st, 1897: "I am quite convinced that Eucaine is fully as good as cocaine, and have yet to observe any

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