

and because he had glasses from a great oculist, even his quick perception had been unable to see that the eyes were the cause of the trouble. For a diabolical refraction-error he was wearing simply and only a pair of weak prisms in his spectacles. It would have done him more good to have buried a lock of his hair at midnight at the crossing of the country roads, with a black cat held by the tail over the grave. Well, the neurologist put him to bed with forced feeding, stopped his reading, and gave him back his lost forty pounds of flesh. When he got about again, his stomach began tying knots when he read, and the old woes began their old round. The heretofore unused mydriatic, when he came to me, gave instant relief of all symptoms and so long as the ciliary muscle was paralyzed there was no stomach-tie or misery of any kind. A few days' gymnastic exercise of the weak muscles of the eyeballs made disappear the exophoria for which he was wearing prismatic spectacles. Glasses correcting his far-sightedness and his unsymmetric astigmatism were ordered, switching of the axes watched, and the almost-ruined neural and digestional functions will, it is hoped, right themselves in time. Perhaps, however, cure will not be effected, because it is a simple truism that in disease, stopping the cause does not always stop the effect. Secondary diseases may have been induced, and such injuries that health can not be perfectly restored. Functional disease leads to organic disease.

I should be sorry to be misunderstood. I by no means say or believe that in every case, or that in the majority of cases requiring the rest-cure, the origin or chief factor of the disease is eye-strain. I do not say or believe that the rest-cure is unnecessary even in cases of reflex ocular neuroses. What I do believe and wish to emphasize is:

1. It is positively criminal negligence to ignore eye-strain in any case requiring the rest-cure treatment.

2. It is not enough to know that the oculist has examined the eyes, especially if it has been done without a mydriatic.

3. To mydriaticize a pair of eyes for a month or two would often do more good, would certainly be more logical, would be an infinitely better means of differential diagnosis in obscure nerve-trouble and functional nutritional diseases than to put the patient's body to bed for the same time.

DISCUSSION.

DR. G. BETTON MASSEY, Philadelphia—I have had some experience with the rest-cure treatment in cases of neurasthenia and I merely wish to take exception to the assumption of the reader of the paper that the "rest cure" is a proper method of treating this affection. The results of my observations have been that the rest-cure treatment is most effective in hysteria, not neurasthenia. After many years' experience with such cases I have never heard of any cure by this means in neurasthenia. In cases of hysteria and anemia, approaching the neurasthenic condition, this treatment may prove thoroughly effective, but it will often do harm in non-hysterical neurasthenia.

CATAPHORIC TREATMENT OF CANCER.*

BY G. BETTON MASSEY, M.D.

PHILADELPHIA.

The insertion of nascent salts of mercury within the human body by electric diffusion in a strength that will deluge a given tract of tissue or a growth with these germicides without materially affecting the remainder of the body constitutes a novel therapeutic procedure which the writer contributed to medical science as a

cure for cancer, in a paper before this Section of the ASSOCIATION at its Philadelphia meeting, in 1897. Further experience with this method in primary cancers and local recurrences in accessible situations has demonstrated an even greater usefulness than was anticipated, as the technic has improved and greater currents have been used.

The importance of this method of destroying germs within the body would be sufficiently great if its applicability to the cure of local cancerous foci is alone considered, for cancerous affections are increasing rapidly in frequency throughout the country, but an examination of the method will show that it may be used for the destruction of any accessible focus of germ growth of any kind, there being but one essential condition to its use, and that is a path for drainage of the products of the dead germs, with which, in the worst cases, certain portions of the stroma are separated. It is, therefore, a most convenient, certain and speedy method of destroying tuberculous deposits in any part of the body except the brain, lungs and abdomen. It may be used to destroy the germ of carbuncle, under ether, leaving a painless and aseptic core to be separated in two or three weeks without inconvenience. It may be used to destroy the infection of wounds, when yet local, and all torpid or indolent ulcerations. I will not dwell at great length on these possible applications of the method, further extensions of which will readily occur to you, but will proceed at once to state in what the method consists, and what success has been attained by it in the treatment of cancer since my last report.

Since the method, in its major applications, is a painful one, it is necessary to place the patient under an anesthetic, and this gives full opportunity for the immediate destruction of all the germs in a cancer, no matter how large it may be. With the patient thoroughly anesthetized, therefore, and lying on a large pad connected with the negative pole of a battery of sufficient power, a small tubular gold electrode that has been amalgamated with mercury is inserted into the growth through a small opening, and an excess of metallic mercury is injected into it through a rubber tube and glass syringe connected with the instrument. This gold-mercury electrode is connected with the positive pole of the battery, this being the pole from which these substances may be radiated. When, now, a strong current is gradually turned on through this circuit electrolysis of the growth and of the mercury occur simultaneously, resulting in the formation of an oxychlorid of mercury, which is radiated from the electrode in all directions toward the opposite pole. The effect of the diffused chemicals is evident to the sight in a few moments when a powerful current is used, a whitish-gray color spreading in all directions from the electrode. The exact speed at which the atoms of mercury travel has not yet been experimentally determined, but it is dependent on the voltage of the current. At a pressure of 110 volts it is probably nearly a centimeter in ten minutes. The density of the diffused chemical is, of course, greatest at the point of diffusion, at the electrode; this results in the area nearest the electrode receiving the diffused chemical in such proportion as to necrose all protoplasm in this situation, producing an area of total destruction, the limits of which are shown not only by the discoloration but by the subsequent formation of a line of demarcation. Beyond this line of demarcation the diffused chemical infiltrates the tissues in a decreasing density, producing a zone of infiltration within which outlying germs and colonies of cancer are destroyed

* Presented to the Section on Practice of Medicine, at the Fiftieth Annual Meeting of the American Medical Association, held at Columbus, Ohio, June 6-9, 1899.

while a mere physiologic reaction occurs in the healthy tissues.

The essence of the method, therefore, is the production of an *area of total necrosis* coterminous with the apparent limits of the cancer, beyond which a *zone of infiltration* causes the death of outlying colonies and latent germs, thus insuring against local recurrence. All this is accomplished in a time varying from fifteen minutes to an hour and a quarter, in accordance with the size of the growth. The aseptic and odorless slough occupying the area of necrosis separates painlessly in from twelve days to three weeks, leaving a cavity that rapidly fills with healthy granulations.

The method is mainly applicable to primary cancerous foci, though certain infected glands may also be destroyed at the same time as the primary growth, and also early recurrent carcinomas and sarcomas may be placed under the method. When the infection gains access to the blood-vessels or to inaccessible portions of the lymphatic system this method is useless. In the larger growths it has been found wise to conjoin the cauterant action of the oxychlorid of zinc from amalgamated zinc electrodes with the pure mercuric cataphoresis for the quicker production of the area of necrosis.

SUMMARY OF CASES.

Since the paper previously read before this body¹ twenty-six cases of carcinoma and sarcoma have been subjected to this method in some manner, in my hands, many of them extremely bad cases—mere forlorn hopes. Of these 10 were operable cases and results are as follows:

Operable cases—Cured, 8; probably cured, 1; failed to cure, 1.—Total, 10.

Inoperable cases—Cured, 2; probably cured, 1; failed to cure, 13.—Total, 16.

Recapitulation—Cured or probably cured, 12 cases; failed to cure, 14 cases.

The fact that two cases have been cured and one probably cured out of sixteen inoperable cases of cancer is a sufficient excuse for the effort to determine the usefulness of this method in advanced cases of malignant disease, but in spite of this modicum of success it is my wish to avoid further efforts in this line, though it may be said that nearly all these unfortunate patients were benefited temporarily by the palliative action of the applications.

It is far different when we consider the result in the operable cases. Among these but one failure occurred, due to neglect on the part of the patient to submit to a second application—a recurrence in an accessible group of glands of the region where the primary growth had been destroyed. All other operable cases—nine in all since the former report—are well to-day and bid fair to remain well. Many of these patients, moreover, retain the organ affected, such as the breast, etc., with unaltered functions, since it is possible by this method to destroy an incipient cancer in an organ without destruction or removal of its unaffected portions.

DETAILS OF SUCCESSFUL CASES—SECOND SERIES.

CASE 1.—W. O., aged 39 years, an employe of a sugar refinery in Philadelphia, consulted me Oct. 11, 1897, with a rapidly growing neoplasm of the upper jaw projecting into the mouth. It had been first noticed by a dentist six months before, on the occasion of some teeth dropping out. It had displaced, by thus loosening them, four healthy teeth in this situation, and the part projecting into the mouth was about two inches by one inch in

diameter. There were evidences, however, of much greater penetration into the upper maxilla, for the cheek on this side showed a decided projection, and what was even more significant, the hard palate was flattened downward on the right side. The clinical evidences thus pointed to sarcoma of the superior maxilla, and this diagnosis had been confirmed by the chief surgeons at the Hospital of the Jefferson Medical College and at the Medico-Chirurgical Hospital, where extirpation of the superior maxilla had been advised.

On Oct. 27, 1897, he was placed under ether, and the pure mercuric cataphoresis with 300 milliampères was applied by means of a gold electrode, for fifteen minutes, with the assistance of Dr. Lindsay and in the presence of Dr. E. P. Bernardy. It was found that the gold instrument was too short to be used conveniently within the mouth, and the application was discontinued before we were certain that a complete effect had been obtained. The next day it was seen that some of the diseased tissue remained, but that the greater portion was well included in the area of necrosis. When the devitalized portion had separated, two weeks later, it was determined to see what could be done by office applications of sharp zinc-mercury points, the growth being but moderately sensitive, though painful as a whole. This was accordingly begun with an average strength of 30 milliampères, and fully completed at the end of two months. This left a healthy sinus extending into the antrum.

This patient has been under frequent inspection since and remains well at this date, a year and a half after. The projection of the cheek bone below the malar prominence has disappeared, and even the flattened arch of the hard palate has receded into place.

CASE 2.—Mrs. B., aged 63 years, of Philadelphia, had had the right breast and a diseased gland in the axilla removed for carcinoma ten months before consulting me for several recurrent nodules situated in the line of the lymphatic vessels leading from the scar to the clavicle. There were seven of these lumps the size of hazel nuts.

On Dec. 11, 1897, with the assistance of Drs. Ida E. Richardson and W. C. Thompson, she was placed under ether and pure mercuric cataphoresis employed with 500 milliampères distributed between three small gold electrodes. The duration of the application was but fifteen minutes, at the end of which time all the lumps were soft. The area of necrosis separated promptly and the cavity healed in five weeks. This patient has remained well during the year and a half that has followed the application with the exception of two minute spots of suspicious texture higher up in the line of the infected lymph vessels. Each of these spots has been removed in ten-minute office applications under the local use of cocaine, a small zinc-mercury needle being used with about 10 milliampères of current.

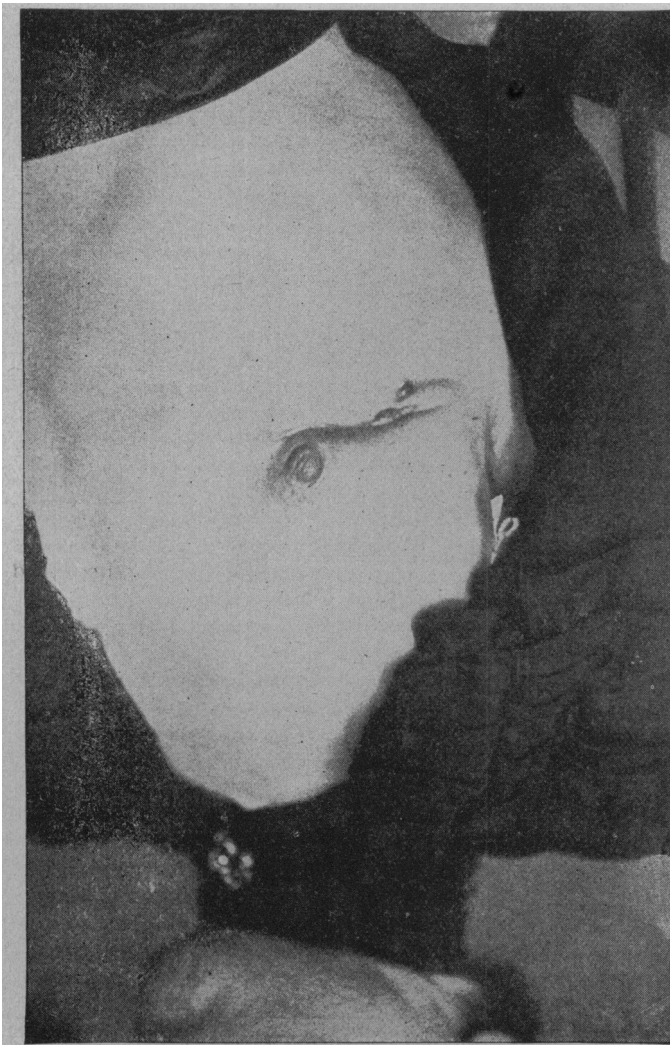
CASE 3.—Mrs. S., aged 56, of West Philadelphia, applied for treatment Dec. 21, 1897, with an indurated and foul ulceration under the left side of the tip of the tongue. A lump had been growing in the situation of the left sublingual gland for six months. Two months before seeing me ulceration began, and it was then so painful as to confine her to liquid diet and leave her sleepless.

On Dec. 28, 1897, she was placed under ether, with the assistance of Dr. S. J. Gittleson, and gold-mercuric cataphoresis was applied with a current of 350 to 400 milliampères for thirty minutes. The ulceration was found to be a cavity in the sublingual gland with indurated edges, about the size of a horse chestnut, emitting probably the foulest odor possible, the surrounding

¹ Medical Record, July 31, 1897.

tissues being deeply indurated. After the current had been flowing fifteen minutes this odor disappeared entirely and did not return subsequently. But little pain remained the next day after the reaction had subsided. Separation and healing were complete in four weeks, except for a small spot in which the disease still existed. She was accordingly given a second application with less current, the healing this time being free from doubt. At the present time, a year and a half after the application, the patient remains well, the mouth being normal except for some cicatricial awkwardness of the lingual movements.

CASE 4.—Miss B. of Philadelphia, aged 51, presented herself Nov. 11, 1898, with a growth in the outer and lower quadrant of the left breast about one by two inches in dimensions. It had appeared only recently and was



Appearance of scar in Case 4 six months after application. The two minor elevations near external corner show where unused mercury came away after healing. They have since disappeared.

beginning to give much pain. On palpation the growth was found to be movable and to present the contour of an acinous carcinoma of the breast. The case had been seen by Dr. Bruce Burns of Frankford, who pronounced it malignant, and advised removal of the breast. On Nov. 16, 1898, she was placed under ether at her home, and a major application of mercuric cataphoresis made, with the assistance of Dr. W. Oakley Hermance. A small gold canula-electrode was inserted into the growth, through which the mercury was injected, and 350 mil-

liampères of current turned on. The current was subsequently raised to 475 milliampères. A grayish necrosis began to form immediately around the electrode, and it was shortly noticed that the malignant hardness began to soften at the periphery of the growth, this softening progressively increasing from without inward. At the end of thirty-five minutes the whole growth had softened. It was now thought best to impregnate the region with the oxychlorid of zinc also, so the current was turned down and the gold instrument replaced by an amalgamated zinc electrode, the current being again turned on for five minutes, making forty minutes in all.

During the following night there was some pain in the zone of infiltration surrounding the necrosed area, readily controlled by morphia, but this pain did not recur again throughout the convalescence. At the end of six weeks the dead portion had come away, leaving a cavity with healthy walls which quickly filled with normal granulations. Several globules of mercury came away during the healing process, showing that an excess had been used. There were no evidences of general absorption of the mercury in a dose capable of detection.

At the present time the breast is soft and movable and entirely free from disease. It shows only a narrow linear scar about one and a half inches long with a depression in the breast at its site. (See cut.) This is the first case in which a carcinoma has been eradicated from the breast—with full preservation of the healthy portion of this organ, under the use of cataphoresis.

CASE 5.—A gentleman aged 79, a resident of Philadelphia, was referred to me by Dr. M. J. Grier, who had removed a wart from the face at the angle of the nose two years before by means of negative electropuncture. The growth had recurred in the same situation, being the size of a small strawberry, and giving evidence of mild malignancy. The problem was to remove or control this growth without detriment to the very feeble health of the aged patient, who could not possibly stand general anesthesia. The effect of very slight currents of but 2.5 milliampères was accordingly tried, applied by means of a sliver of amalgamated zinc inserted into it slightly. Each application of this extremely mild cataphoric method has appeared effective in destroying a bit of the growth, and at the present time only an infected base remains that could easily be cleared away were it possible to make a very slight increase in the current or frequency of application. Meantime the growth is kept under full control.

CASE 6.—A physician of York, Pa., aged 66, had been the subject of rodent cancer of the face for twenty years, during which time the growth had been operated on once at the Hospital of the University of Pennsylvania with but temporary results. On January 16 last he applied for treatment by the cataphoric method. The erosion was at this time about four inches long by two wide, extending from above the eye on the right side of the face to the middle of the cheek. The right eye was being threatened, the orbicular muscles and outer canthus being eroded through, and the outer table of the skull had been eaten away, leaving the skull exposed over a small area.

As the patient dreaded anesthesia, he was treated by the mild method, with prolonged daily applications of small zinc-mercury points and currents varying from two to ten milliampères, the pain being lessened by the local use of cocain. The effect of each application was immediate, both locally and at a distance, and now as a result of about three months' treatment, with intervals of non-treatment, all malignancy has been eradicated

and the site of the growth has filled in with healthy skin by extension from the edges. This case was a beautiful instance of the efficacy of the zone of infiltration, by which a remedial effect was obtained far beyond the mere area of cauterization.

CASE 7.—Mrs. M. S., aged 57, a patient of Dr. A. F. Müller of Germantown, Pa., who kindly referred her to me, was suffering from a carcinoma involving the whole of the left breast. The growth had been discovered about ten months before and was rapidly increasing in size and beginning to give pain. The axillary and supraclavicular glands were healthy.

The condition here was a completely diseased breast that could easily have been removed entire with the knife. The problem was to so remove the disease as to insure a greater immunity from recurrence than the knife gives. The large bulk of the growth, situated just over the heart, suggested to me that the greater portion of it could be impregnated with the chemicals by a local circuit, which would permit a larger current and greater expedition than would otherwise be possible in this situation. With the kind assistance of Drs. Müller and Hermance, the patient was etherized and a ring of zinc-mercury electrodes was inserted around the periphery of the growth, each electrode pointing toward the center. All were connected to the positive pole of the battery. On the center of the growth was placed a cotton-covered disc, saturated with Fowler's solution, to act as the negative pole. When the current was turned on the mercury and zinc radiated from the peripheral electrodes and arsenic from the central disc, thus attacking the growth from both directions, the two sets of materials rapidly devitalizing the whole substance of the cancer. Eight hundred milliampères were found to be possible in this manner, though above this amount had a temporarily depressant action on the circulation and respiration. After complete softening and necrosis of the growth had been secured the negative cord was shifted to a large pad on which the patient lay, the current being turned off, and 400 milliampères were employed for a time in this monopolar way to produce an efficient zone of infiltration. The total time of application was an hour and a quarter, and the subsequent history of the patient was the same as that of Case 4. The whole tumor, consisting of the entire breast and underlying fatty tissue, came away on the twenty-second day, having been odorless and painless throughout. The cavity left on separation measured 7 by 4 inches, which has greatly lessened in area in the healing process.

I will not occupy further space with the details of the remaining cases, in one of which, a carcinoma of the breast, a diseased gland in the axilla was destroyed at the time of the application to the breast, for sufficient time has not yet elapsed to insure accuracy of results.

CONCLUSIONS.

1. The massive diffusion of nascent mercuric salts within a growth or cavity of the body by an electric current constitutes a novel therapeutic procedure of great value in the destruction of foci of malignant or non-malignant germ growths, when said growths are so situated as to permit of penetration and drainage.

2. This cataphoric destruction of the germs of a primary cancerous growth in situ, including outlying colonies and so-called roots of prolongation permits the preservation of the unaffected portions of the organ in which it is situated, and offers greater security against a recurrence of the growth than efforts to remove the living malignant organisms by cutting operations.

3. While the cataphoric method may be employed as a

palliative in non-operable malignant growths, and may at times cure them, its chief value is in the total destruction of the malignant germs in the early stages of primary growths, and in the same stages of purely local recurrences.

TREATMENT OF ANEURYSMS BY EXTIRPATION: WITH REPORT OF CASE OF POPLITEAL ANEURYSM TREATED BY THIS METHOD.*

BY JOHN CHADWICK OLIVER, M.D.

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CINCINNATI, OHIO.

The following report of a case of traumatic aneurysm of the popliteal artery occurring in a syphilitic subject can be used as the text for a few remarks on the general subject of aneurysms, but more particularly on those which develop in the popliteal space.

John Taylor, a strong, well-developed negro, 29 years of age, had enjoyed good health until six years ago, at which time he contracted syphilis. Primary and secondary manifestations left no doubt as to the nature of his malady. He was admitted to my service in the Cincinnati Hospital, Feb. 24, 1899. Four weeks previously he had slipped and in falling had struck his ankle and the outer surface of the left knee against the curbstone. He is not certain as to whether a swelling was immediately apparent, but a dull, throbbing pain was present almost from the time of injury. This pain was always worse at night, and was increased by attempts to extend the leg. Sometimes there was a feeling of numbness in the leg. He had been treated for rheumatism.

When admitted to the Hospital his pulse was 80 and his temperature 99.6 degrees. He complained of great pain and walked with much difficulty. The left leg was semiflexed and held rigid because of the pain produced by extension or movement. The typical symptoms of aneurysm were present, but the tumor seemed more superficial than would be expected in true aneurysm. The swelling extended more toward the outer than the inner side of the popliteal space.

Because of the ease with which fluctuation could be elicited, and because of an elevated temperature—ranging between 99 and 101—it was deemed expedient to rule out the possibility of the swelling being dependent on an abscess. A hypodermic needle introduced into the mass withdrew a syringe of clear blood. The knee of the left side was one and one-half inches greater in circumference than its fellow. Pulsations in the dorsalis pedis artery were not present, nor could we be sure as to their presence in the posterior tibial; sometimes there seemed to be slight pulsations, but they were never so strong as to remove the element of doubt from our observation.

It seemed good policy to thoroughly prepare the patient for operation by the administration of iodid of potassium in large doses. This remedy was not given for the purpose of producing any direct action on the aneurysm, but to, theoretically at least, put the artery in a better condition to retain a ligature. Codeia was given to relieve pain. The leg was immobilized by bandaging it to a posterior splint. This treatment was continued for three weeks.

On March 16 the operation was performed. Two Es-

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