

quantity of warm water possible and swallowed. This to be then followed by a large quantity of any mild fluid, even water. The mixing thus takes place in the stomach instead of in the glass. The patient may begin to eat after the bowels are well moved on this day. It is best that they should eat sparingly and avoid distress from engorgement. The same precautions should be observed on this day regarding fats, oils, alcohol, etc.

Once the worm is eradicated, fresh air, sunshine, plenty of water and proper food are the chief requirements for the treatment of the anemia of hookworm disease. Iron, arsenic, tonics and ferruginous vegetables are indicated. The patient should be treated at intervals of one, two or three weeks until the stool is free from eggs or parasites. The more debilitated patients should be treated at longer intervals.

Betanaphthol is not so toxic to the parasite as thymol, but has a more toxic action on the kidneys. The anthelmintic properties of turpentine are less than those of thymol; besides turpentine is less desirable because of its ready absorption and liability to produce an acute nephritis. Pressed thymol tablets should never be used.

REMOVAL OF NEOPLASMS OF THE URINARY BLADDER

A NEW METHOD, EMPLOYING HIGH-FREQUENCY (OUDIN)
CURRENTS THROUGH A CATHETERIZING
CYSTOSCOPE*

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This brief preliminary report is written with the object of calling the attention of the profession to a new and simple method of destroying new growths of the urinary bladder. Even though my experience is not extensive, limited as it is to two large papillary growths, still the observations made leave no doubt in my mind that the Oudin current, employed as I have employed it, will prove effective in the cure of benign papillomata, as well as useful in malignant tumors, papillomatous or not, both as a hemostatic and as a cauterizing agent.¹ My experiences also suggest the usefulness of these currents in many other conditions both in the bladder and in other parts, e. g. tuberculous ulcers of the bladder, prostatic hypertrophy, growths in the urethra, etc.

In March, 1908, I hit on the idea of using the high-frequency current as I now use it. Expert electric manufacturers told me I could not obtain the effects I desired through a water medium; that an air gap was necessary. Moreover, that if I used the current as I intended, it would burn out my cystoscope. Others who had experience with these currents in skin conditions were equally pessimistic. Despite these opinions I ordered from the manufacturer a thoroughly insulated cable, No. 6 French caliber, so that it could be introduced readily through the catheter tunnel of a Nitze catheterizing cystoscope. My experimental work was confined to the removal of skin warts through a water medium I soon convinced myself of the efficacy of this

therapy, despite the absence of an air gap. I also tested my Nitze cystoscopes and found that they stood the test perfectly. They were not burned out and I could readily see what was going on at the end of the electrode though very rarely an insignificant variation in the intensity of the light occurred.

Through the courtesy of Dr. A. G. Gerster, I was able to try out this new method in an inoperable tumor of the bladder in a woman of 81. In a second case, that of woman of 66, I employed this method also. Both patients were troubled with hematuria. In the second case the bleeding was very active, while in the first case it was moderate when the treatment was begun. As my experiences in these cases were highly satisfactory, I hasten to lay them before the profession, that others may avail themselves thereof.

TECHNIC, ETC.

Instruments—1. I employed the Oudin current derived from a Wappler machine, placing the rheostat vertically so that one-half the resistance was thrown into the circuit. The spark gap in the muffler was approximately 1/10—1/8 inch.

2. Nitze, double-catheter cystoscope was used. In one catheter tunnel, I placed the electrode introducing it just as one introduces a catheter while to the other catheter tunnel I attached a tube for irrigation.

3. The electrode was a simple 6-ply cable of copper wire thoroughly insulated with rubber and cut off squarely at the vesical end. It measured No. 6 French and was made for me by the Wappler firm.

Application—The applications were made directly to the growth, the electrode being pushed a short distance in among the villi under the guidance of the eye and then the current was turned on for fifteen to thirty seconds at various points. The bladder was distended with distilled water. Experience may show that some other medium is preferable in view of the fact that ionization with magnesia appears particularly effective in removal of skin papillomata.

EFFECTS AND RESULTS

The immediate visible effects are very striking. No spark is seen even when the full current is thrown on without any resistance. While the current is on gas is generated quite freely and is seen bubbling out of the growth. If the point of application is superficial we can readily see a blanching of the tissues about the point of application; and at the spot where the electrode's point rested, the tissues are blackened—carbonized. As the electrode is withdrawn from the growth, very frequently it is found to be adherent to the villi, and as it is pulled on, the whole tumor moves with the electrode, which finally comes away with a piece of the tumor well baked to its vesical end.² This is only rarely followed by bleeding and a reapplication of the current at the same spot controls this bleeding. The great heat generated melts the insulating rubber at the end of the electrode so that one has to cut it off squarely from time to time, to prevent the wires from protruding freely and injuring the bladder wall.

In the second case the very first application of the current controlled the bleeding to such an extent that cystoscopy, which had been almost impossible, owing to the excessively rapid clouding of the medium from the arterial bleeding, became fairly easy. Eight applications at one sitting to various parts of the growth, ag-

* From the First Surgical Service of Mount Sinai Hospital.

1. In early cases of malignant disease a complete destruction may be possible

2. These fragments have been used for microscopic examination.

gregating in all four minutes, controlled the bleeding. In the first case, the hematuria was equally well controlled, but the result was less striking than in Case 2, in which the severe hemorrhage ceased at once and intensely bloody urine gave way to normal yellow urine.

Such applications of fifteen to thirty seconds seem to cause a very well-marked necrosis, which is in part due to the heat engendered. Other factors probably contribute to the final result. How much ionization, electrolysis and other factors contribute, I cannot state as yet. By making applications at eight to twelve different points in the two large tumors treated, a total necrosis of all the villous outgrowths followed with absolute cessation of hematuria. Gradually during three to five weeks the dead tissue separated from the healthy and the tumors were expelled in small masses, as the mucous membrane gradually grew in around the base of the dead tissue.³ No ulcers were visible at any time.

The treatment caused no more discomfort than an ordinary cystoscopy. The bladder mucous membrane was but little affected by the application though some congestion and trigonitis developed in the vicinity of the growths.

At some future date, I shall report these cases in full, which is hardly necessary for this preliminary note.

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ANIMAL EXPERIMENTATION IN RELATION TO PRACTICAL MEDICAL KNOWLEDGE OF THE CIRCULATION*

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(Continued from page 1684)

II. MODERN VIEWS OF AND METHODS OF STUDYING DISEASES OF THE CIRCULATION

In Part I of this paper the attempt has been made to present in the briefest possible form the fact that we owe our knowledge of the circulation primarily to animal experimentation. This paper has been written for the purpose of showing the practical bearings of the knowledge so gained on our understanding of certain phases of human pathology.

There could be no more emphatic way of bringing home to the practicing physician the practical results, so far as the cardiovascular system is concerned, that have accrued through the application to human pathology of the results of experiments on animals than to transcribe in full for his consideration the parts dealing with disease of the blood-vessel system, first, from some work that was standard before the Renaissance, i. e., before the importance of animal experimentation was fully realized, and, secondly, from a work that is standard to-day, calling attention to the differences between them and indicating how far such differences are due more or less directly to experiments on animals. Unfortunately, however, the limited scope of this paper precludes the

* This paper is one of the series prepared for and reprinted by the Council on Defense of Medical Research of the American Medical Association for circulation among the public. Fourteen of these pamphlets are now ready, taking up the relations of animal experimentation to ethics, diagnosis, cancer, vaccination, the live stock industry, tuberculosis, typhoid, dysentery, plague, rabies, surgery, internal secretions, the circulation of the blood, protozoan tropical diseases, etc.

3. If the flat base of the growth remains after the sloughing of the necrotic villi, these small areas must be treated in turn directly, to produce a cure. To avoid perforating the bladder, shorter application of fifteen seconds should be used here, such as I used in Case 1.

full treatment of the subject in this way. I must, therefore, content myself for the present with brief extracts and discussions which, it is hoped, will furnish the reader material about which he may group his own ideas on the subject. It should be added that the extracts given below have not been selected at random, but only after careful consideration and as representing the views which, in my opinion, are in closest accord with those of the most enlightened thought of the time.

I select as the work from which to quote the views held prior to the revival of learning, "The Seven Books of Paulus Ægineta with a Commentary Embracing a Complete View of the Knowledge Possessed by the Greeks, Romans, and Arabians on all Subjects Connected with Medicine and Surgery,"² which dates from the seventh century. This work has been selected, first, because of its accessibility, and, secondly, because it purports to be a more or less complete compendium of the then known medicine.

The section on the heart is brief and may be quoted practically without abbreviation:

When the heart itself is primarily affected, the case is far beyond all medical aid, occasioning sudden death; and also in the inflammations and erysipelas of it, strong distempers in very acute fevers, and hemorrhages when it is wounded, especially in the left ventricle. When it is affected sympathetically with the brain, the liver, the orifice of the stomach, and from sorrow, fear, and many other causes, it brings on the affection called syncope, being a sudden collapse of the vital powers, indicated by prostration of strength, delinquium animi, a small pulse, coldness of the extremities and copious perspiration. When this affection is of a violent nature, it also is irremediable; but if the strength stands out, it may sometimes be relieved. But strong palpitations of the heart often arise from a fulness or effervescence of its blood. When, therefore, the heart is overheated, it renders the respiration large and dense, but when it is too cold, the respiration is small and rare. The complete cure of syncope of the heart, when it occurs among the symptoms of fever, we have treated in the Second Book. This only may be added, that when collapse gains ground after friction and ointments have been applied to the extremities, and after purification of the floor, and other cooling means, we must sprinkle on the parts of the body which are sweating powdered myrtle, limolian earth, or amber, or pomegranate-rind with marena, or Samian earth with gum; and cataplasms of mustard or pellitory, adarce, are to be applied to the cold extremities, as far as to the groins and armpits. The food should be bread out of water, or out of cold diluted wine, swine's feet and joints and snout, and fowls; all things to be given in a cold state. . . .²

Under the topic of "palpitation of the heart" there is found the following interesting passage:

"I knew a certain person," says Galen, "who suffered an attack of palpitation of the heart every year in the season of spring. Wherefore, having for three years experienced benefit from venesection, in the fourth he anticipated the attack by getting bled, and so escaped from it, and did so for many years afterwards, using at the same time a suitable diet. And yet even he died before attaining old age, as every other person in this complaint does, some being suddenly cut off in acute fevers by syncope; but some of them without syncope, being unexpectedly deprived of life, as if by apoplexy. The majority of those who are thus affected do not reach the fiftieth year of age, but pass the fortieth."²

Finally the ideas held by Paul of Ægina in regard to dropsy are set forth in the following passage:

Where the liver is greatly congealed, sometimes primarily, as when it has been inflamed, indurated, or otherwise affected, or when from sympathy with other parts the process of sanguification ceases, and the affection is called dropsy. . . . But, for

1. Transl. by Adams, London, 1844.

2. Paul of Ægina: Seven Books . . . , i, 501.