of the patients by having them keep pearls of amyl nitrite and break them when they feel an attack coming on. I grant you the effect is transient, but the result may last long enough to prevent such cardiac failure or strain as might cause death. Morphine does give great relief, but you see some cases in which morphine has no effect at all as you see cases in which amyl nitrite has no effect. I have learned, in cases in which morphine will not relieve to give a very unfavorable prognosis, that the patient will possibly not improve much. Younger people, who are more or less neurasthenic, who have a mild degree of pain, are quite a different class from those with anginoid or typical anginal pain. From the practical point of view it is not wise to make any distinction between typical attacks of angina and the milder attacks in persons 55 or 60 years of age. Essentially the attacks are the same and the patient is in danger. I was particularly interested in Dr. Hirschfelder's advice for slow movement and I think that it saves patients.

DR. B. FANTUS, Chicago: I should like to say a few words in favor of bromide in the prophylaxis of anginoid pains. According to the helpful classification of Dr. Greene anginal pains are due to changes in the heart-muscle and to excessive nervous irritability. It seems that, where the latter condition predominates, bromide might be of value. I know of a number of patients who have again and again taken bromide because they thought it made their attacks less frequent.

DR. LOUIS FRANCISCO ROSS, Richmond, Ind.: I wish to say a word about slow movements. I happened to have two or three of these patients who could not remember to move slowly, especially to go up stairs slowly, which is most important. I therefore told them to go up stairs as children do, taking the up step with the same foot. After they established this habit they necessarily went up slowly and got on much better.

DR. RAY L. WILBUR, San Francisco: I should like to ask Dr. Greene to speak on these pains from the point of view of "hollow-organ pains." We have in the bowel similar spasmodic conditions. These pains occur also, apparently, in the wall of the ventricle. I wonder whether the use of strychnine is of any service. Perhaps the combination of morphine and strychnine is better, since we find the bromides of benefit in limiting the susceptibility to the pain. I should be inclined not to use the strychnine under such circumstances.

DR. CHARLES LYMAN GREENE, St. Paul: The point that I wish to bring out primarily is the fact that we are not at the present time paying sufficient attention to cardiac disease in its earlier stages. We are taught and we have taught others in the past to treat only cases of frank, gross, obtrusive insufficiency. This is no more right in the case of heart disease than in the case of tuberculosis. My asthenic cases have given me an excellent opportunity to study certain minor insufficiencies which in this type of individual seldom become anything serious, and it has been most interesting to see the fragmentary picture and then perhaps a replica in miniature of the anginal attack. These cases cannot represent anything else than hollow-organ pain. Asthenic patients have a hidden nervous irritability; they all show increased knee-jerks and intense psychic response and it is very easy for a slight dilatation in them to cause most curious and occasionally quite severe manifestations of cardiac distress. I have been interested in seeing patients with abdominal localization narrowly escape operation for gall-stones. A patient whom I saw not long ago entirely relieved by a week's treatment of the heart showed an unusual localization of her maximum distress over the lower abdomen. Then pain in the shoulder and back, and curious headaches are often encountered. I believe that we must and ought to consider these various pains as coming from the same cause throughout, representing in every instance identically the same thing, a hollow muscular organ unable to do its work and protesting in its own way. These cases are in fact almost constantly being mistaken and treated as cases of so-called nervous exhaustion and, fortunately, because of this fact these patients are properly nourished and put at rest, which is just what the asthenic heart needs. As regards the institutional care of anginal cases a trip abroad

for a patient with genuine angina pectoris is a good thing if they go to the good institutions where they have skilled physicians and where the regimen is properly carried out. I agree with my colleague's estimate of bromides in these cases and I did not speak of the iodids because I do not believe that anyone knows enough about them to talk about their effect in these cases, though we must recognize the fact that a large proportion of our arteriosclerosis cases involving the aorta and the coronaries are luetic and the value of iodids in certain of these cases is unquestionable. I wish again to express my wonder that there should be such morbid fear of giving digitalis. We all know now that the digitalis does not affect the normal heart nor does it affect the heart which is compensating even though diseased. Then why should we be afraid to give the doses required to test its efficiency and establish the presence or absence of a dilatation often unrecognizable by other means?

POTASSIUM PERMANGANATE AS A LOCAL ANESTHETIC TO THE GENITO-URINARY MUCOUS MEMBRANES

A PRELIMINARY COMMUNICATION

WILFRED M. BARTON, M.D.

Associate Professor of Medicine in the Medical Department of
Georgetown University

WASHINGTON, D. C.

In a search through the literature and on inquiry among my colleagues, some of them genito-urinary specialists, I have not been able to find any reference to or knowledge of the anesthetic action of potassium permanganate. Inasmuch as my own experience and investigation have shown that the drug possesses local anesthetic powers of no inconsiderable degree on the mucous membrane of the genito-urinary tract, I report the fact, together with a brief account of the circumstances which led to its discovery and a limited amount of experimental data in support of it.

Some time ago I found, accidentally, in the following case, that the injection of potassium permanganate into the urethra and bladder caused a transitory but complete desensitization of the mucous membrane of the urethra, anterior and posterior, of such a degree and character as to allow of the painless passage of sounds.

Patient.—White man, had had fifteen years previously, a gonococcus infection, anterior and posterior, which lasted over six months. He complained of bradynuria which dated back to the infection. On examination the patient was found to require fifteen or twenty seconds to void 150 c.c. of urine, the last portion being voided by ejaculatory efforts and manipulation of the penis. The prostate was neither enlarged nor tender; the urine was clear and free from shreds and entirely negative on chemical examination.

He seemed quite timid concerning the examination of the urethra by sounds. Having noted on previous occasions, while using potassium permanganate in irrigating subacute and chronic gonorrheal urethritis, that the primary sensitiveness following injection soon disappeared and was replaced by apparent desensitization I determined to try the effects of irrigating the urethra with solution of permanganate of potassium to see whether a real anesthesia of the mucous membrane could be obtained.

Experiment 1.—5:00 p. m.: Finished irrigating the urethra anteriorly and posteriorly with 1,000 c.c. of solution of potassium permanganate (strength not noted). Irrigation was made with blunt urethral tip not catheter.

5:02 p. m.: Sensation of slight warmth in urethra. A No. 24 F sound sterilized and well lubricated was passed painlessly.

5:05 p. m.: A No. 26 F sound was passed painlessly. Very slight sensation of stretching experienced, not disagreeable.

5:15 p. m.: Introduction of sound into anterior urethra causes smarting.

Experiment 2.—Same patient on another occasion.

4:25 p. m.: Finished irrigating urethra and bladder with 1,000 c.c. of solution of potassium permanganate 1:2,500.

4:27 p. m.: The urethra, tested with lubricated sound 26 F, was found desensitized, and the instrument passed into the bladder without pain.

4:30 p. m.: No. 28 F sound passed without pain. Some sense of tightness felt as sound passed stricture of large caliber. Removal of instrument required slight traction but caused no pain *in situ*.

Experiment 3.—Normal urethra.

6:02 p. m.: Finished irrigation of urethra and bladder with 1,000 c.c. of 1:5,000 solution of potassium permanganate.

6:04 p. m.: Mucous membrane of meatus slightly less sensitive than normal to touch of sharp instrument (sterilized needle).

6:05 p. m.: Very slight sensation of warmth in urethra.

6:07 p. m.: Passage of No. 26 F sound effected with only very slight sensitiveness more especially in the deep urethra and this quite negligible. Slight discomfort felt after withdrawal.

6:10 p. m.: Meatus almost desensitized to touch of sharp instrument. Discomfort following withdrawal of No. 26 F sound gone.

6:14 p. m.: Passage of end of No. 28 F sound into anterior urethra produces burning and smarting and attempts at further penetration cause pain. Sensation of meatus to sharp instrument returned.

The anesthesia period obtained in the above experiment (No. 3) is therefore slightly less than ten minutes, coming on within two minutes after completion of irrigation with solution of potassium permanganate in dilution of 1:5,000. An attempt to reirrigate the anterior urethra in Experiment 3 with 1:5,000 solution at 6:20 p. m. produced smarting and burning and was discontinued. A period of redensitization appeared which lasted five minutes.

The preceding experiment was repeated on divers occasions and the results found to be the same.

Experiment 4.—Normal urethra.

5:09 p. m.: Finished irrigating urethra and bladder with 1,000 c.c. of 1:10,000 solution of potassium permanganate.

5:11 p. m.: Meatus sensitive, though perhaps less than normally, to touch of sharp instrument.

5:14 p. m.: Passage of No. 28 F sound into urethra accompanied by some smarting, particularly when passing through posterior urethra.

DEDUCTIONS

It will thus be seen by Experiment 4 that anesthesia of the mucous membrane of the urethra so completely and satisfactorily produced by solutions of potassium permanganate in the strength of 1:2,500 or even in 1:5,000 is incomplete and unsatisfactory when the dilution is raised to 1:10,000.

The minimum limit of dilution to obtain satisfactory anesthesia therefore lies at 1:5,000. The maximum limit of concentration will of course be governed by the fact that solutions in excess of 1:2,000 in the posterior urethra should not be used.

It is perhaps superfluous to speculate on the explanation for the undoubted anesthetic power of potassium permanganate on the urethral mucous membrane. When a solution of this substance comes in contact with organic matter as albumin the permanganate parts immediately with a large portion of its oxygen becoming thus reduced. The oxygen attaches itself to the proteid producing a certain degree of chemical change, probably in the direction of oxidation. After the permanganate is reduced it loses its action.

Experiments which I have made on the skin show that it is entirely unable to produce any anesthesia here. This is prob-

ably due to the impossibility of penetration to the nerve terminations before reduction of the compound takes place.

The practical deductions from the facts above stated are limited though important. A method of producing a satisfactory anesthesia of the mucous membrane of the urethra and bladder devoid of any possibilities of toxic phenomena whatever and extremely simple in its application should be welcomed by those who are called on to perform painful instrumental manipulations on the genito-urinary canal and especially so by those who are called on through unfortunate circumstances to submit to them.

1730 Connecticut Avenue N. W.

NEW STYLE DRAIN-PAN FOR OPERATING-TABLE

W. M. HAYES, M.D., NEW ORLEANS

The old style drain-pan being oval or nearly circular, there has always been trouble in keeping it sufficiently near the

Fig. 1.—New drain-pan, showing flat back surface.

Fig. 2.—Pan placed squarely against lower rods of table.

operating-table. When placed against the lower supporting rods of the table, the pan would rotate from place to place along the side of the table, allowing the refuse which should drain from the Kelly pad into pan, to go on the floor, much to the annoyance of the operator and his assistants.