bacillus, streptococcus or pneumococcus infection of the jaw is present, the drilling may do harm. I do not believe it wise under such circumstances to make incisions of any kind in the mouth, as it seems to intensify the inflammation, probably due to the introduction of other organisms from the oral cavity. If we know that the infection is due to a dead pulp and that the pus is very limited in quantity we might evacuate it through the tooth, but often this is impracticable owing to the small caliber of the root-canals.

I believe that making an opening on the outside of the face is the only way we can get good drainage in the posterior portion of the mouth when there is great swelling. Good drainage is of prime importance. In these serious cases mouth incisions invite mixed infections, which may add to the gravity of the case. I agree with Dr. Schamberg that where an abscess can be reached from within the mouth and thorough drainage maintained, it is indicated, but there are many cases in which this cannot be done.

DR. M. J. SCHAMBERG, New York: There is scarcely a week in which I do not open externally several times for the drainage of neglected abscesses and in a few cases of osteomyelitis. Danger, however, may arise from Dr. Babcock's advocacy of the external incision for the purpose of puncture in the early stages of a condition which may or may not exist and in which there is so great a difficulty in making a diagnosis. I would not agree with any paper that suggested an external incision where there was even no likelihood of finding pus; definite means of diagnosis should be arrived at before such a method is generally advocated.

DR. W. W. BABCOCK, Philadelphia: The question has been very properly brought out by Dr. Schamberg as to the definition of osteomyelitis. If what I am talking about, and what you are talking about are different conditions, our conclusions cannot harmonize. Of course, in osteomyelitis we can include any inflammation involving the marrow cavity and adjacent bone. I direct attention to-day, not to a limited osteomyelitis but the form involving in many cases the nutrition of the entire lower jaw. I would consider only those cases in which the result is an involvement of all the nutrient vessels of the inferior dental canal. When this occurs, the first question is not whether we are to save the teeth or avoid scars, but rather whether we are to save the patient's life. As to prophylactic drainage, I do not think it makes a great difference whether we go from the inside or outside of the mouth, because an opening about the size of a gimlet-hole does not make much of a scar externally nor is there much danger of infection if we open from the inside. Later, however, free drainage may be extremely important, and it is advisable to open from the outside, because the tissues can be kept more aseptic, the drainage freer and the patient does not swallow the discharges. It is not a matter of a week or month in these cases, but usually a matter of a year or two years—and the tissues may discharge not pints but gallons of pus. In such patients it is paramount that this toxic material freely escape from the body. A curet may serve to spread and carry the infection.

The symptoms are not so clear as we would like to have them. First, there is little swelling or severe toothache. The swelling and loosening of the teeth, discharge of pus and necrosis are secondary symptoms.

The features are the early chill and fever. The early local symptoms are relatively inconspicuous; the pain may not at first be referred to the jaw. The degree of tenderness is also peculiar. Early transient pressure may not cause pain, and it is only when we make firm pressure continuously over the body that the patient finally cries out. It is not like an alveolar abscess or exposed dentine which is sensitive on the slightest touch. In the early stages the sensitiveness is not on the outside of the bone because the inflammation has not reached the periosteum. Early edema indicates different conditions. If from a streptococcus or pneumococcus infection, suppuration may not occur.

As to the pulp in the involved teeth, does it remain or putrefy or what happens to it? That all pulp cavities should be evacuated and cleaned out is impracticable as the teeth are so loose that they may often be picked out with the finger.

The apical foramen is often exposed in the mouth and the drainage from the pulp cavity does no harm. The strange point is, if the pulp dies, why do the teeth at times retain their color and translucency? Later the pulp may regain some sensitiveness. How that could occur in a dead tooth is hard to understand. Hunter's experiments showed that a tooth imbedded in the comb of the cock had new vessels projected into the pulp cavity. We must remember that the condition in osteomyelitis is different from the imbedding of a dead tooth that may last only ten years and be absorbed and thrown off. The teeth are never completely detached or absolutely separated from their source of nutrient supplies. They may become, I believe, under certain conditions, revitalized.

THE DUBOSCQ COLORIMETER AS A MEANS OF ESTIMATING HEMOLYSIS IN THE WASSERMANN REACTION *

ROBERT H. IVY, M.D.

PHILADELPHIA

Many methods have been devised to measure accurately the amount of hemolysis in the end-reaction of the Wassermann test. Notable among these is that of Boas, who makes a set of ten standard tubes, showing hemolysis ranging from 10 to 100 per cent., with which he compares the color of the tube at the end of a given test. So far as I know, however, the Duboscq colorimeter has not hitherto been put to this use.

For most practical purposes the naked eye is sufficiently accurate in reading the end-result of the reaction. By it we can readily determine that the reaction is strongly, medium or weakly positive, but there are cases in which hemolysis is almost complete, in which a more accurate reading is necessary to decide whether the reaction should be called weakly positive or negative, particularly those in which the effects of treatment are being gauged by the reaction. A difference of 5 per cent. of hemolysis can be detected by the Duboscq colorimeter. In cases in which the reaction is being used for diagnostic purposes only, 90 per cent. of hemolysis and over is regarded as negative, between 90 and 60 as weakly positive, between 60 and 30 medium positive and from 30 to 0 as strongly positive. In cases in which the effects of treatment are judged by the reaction, 90 to 95 per cent. of hemolysis should still be regarded as positive.

For the standard solution, the fluid in the control tube of each case in the Wassermann test is used (back row), and is regarded as 100 per cent. hemolysis. This fluid can be diluted to any desirable amount to be placed in the colorimeter, provided that the fluid from the tube to be tested is similarly diluted. It is understood, of course, that the original amount of fluid in each tube must be the same. The standard fluid from the control tube is placed in one side of the colorimeter and the fluid to be tested in the other. The screw is turned until the two solutions have a homogeneous color, and the readings and calculation made as in the case of estimating renal function with phenolsulphonephthalein. Thus the reading on the standard side is used as numerator, that on the side to be tested as denominator, and the fraction multiplied by 100. As can be seen, it is not necessary to apply the method in all cases, and it can be quickly performed in the few cases in which it is found necessary. It has the advantage that there are no standard tubes to deteriorate, as but one is required, and this is fresh at hand every day the reading is made.

1623 Walnut Street.

* From the Genito-Urinary Department, Philadelphia Polyclinic.