CONCLUSIONS.

From the observation and study which have been made of these patients through a period of six years it seems that the following deductions are warranted:

1. The case is under excellent control, as the apparatus can not be removed and replaced by the patient or family at will.

2. The appliance can be produced at much less expense than any other that is efficient. These two considerations are of the utmost importance in clinics where the cost must be taken into account, and where the ignorance of the family causes them to meddle with the apparatus through their own ideas of what is best, or from those of near-by friends who are only too ready to contribute their experience and skilful advice.

3. The duration of the treatment may be lessened, which is a factor to be thought of; there is less danger of abscess formation; and the preservation of the joint structure is more certain.

4. Finally, the position of the limb can be regulated to a nicety otherwise obtained only through the use of expensive apparatus accurately adjusted by skilled hands and kept constantly under the closest observation.

THE ROENTGEN RAYS IN ORAL SURGERY.

DESCRIPTION OF A ROENTGEN TUBE FOCUS FINDER AND LOCALIZER.*

G. E. PFAHLER, M.D.
PHILADELPHIA.

The Roentgen rays have demonstrated their usefulness in diagnosis in all branches of medicine, and not the least in oral surgery. Without doubt many, if not all, physicians make use of it in all obscure cases. My object, therefore, is simply to show my methods of application of this agent in the diagnosis of true oral surgical conditions and to describe a little device which has been of great assistance to me in all kinds of Roentgen examinations, but particularly in this field.

A ROENTGEN TUBE FOCUS FINDER AND RAY LOCALIZER.

One of the difficulties encountered since the discovery of the Roentgen rays has been to determine the exact focus point on the anode of the tube. This is especially difficult with a new tube that has not had its focus point burned. The next difficulty, since the diaphragm technic has become practically universal, is to place this focus point exactly in the center of the diaphragm. The third difficulty is to know exactly where the center of the field will be and precisely the direction that the most central ray will take. This is especially difficult when we are making the exposure in an oblique direction, such as is commonly done in the study of the maxillæ. These three difficulties have had to be overcome at each exposure with great care, patience and good judgment. We need, however, a mechanical device which will overcome these difficulties absolutely and thus make our work more exact.

To overcome these three difficulties I have designed a very simple device that does not expose the operator to the rays, that is convenient to operate and that renders results accurate. The device with slight modification is applicable to any diaphragm, but to meet my own

needs I have adapted it especially to the Roentgen table. It consists of a piece of sheet iron or lead that will exactly cover the diaphragm opening. To the center of this sheet iron is screwed a piece of brass tubing eight inches long and having one-fourth of an inch bore. This piece of tubing is then arranged to contain a second piece of tubing similar to a telescope.

For use with the Roentgen table the sheet iron is made square, 13.7 cm. (about 5½ inches), which exactly fits into the diaphragm clamp. To the center of this is attached the telescopic tube (Fig. 1). This is then adjusted so that the rays pass through the tube on to a fluorescent screen lying underneath. The focus point will have to be exactly over the center of this tube or no rays will pass through (Fig. 2). Having found the position of the Roentgen tube that will exactly allow the rays to pass through the brass tube and cast a circle on the screen, we know that the focus point is exactly central. The Roentgen tube is then marked by a piece of adhesive plaster so that it can be replaced at any time in exactly the same position.

This focus finder is then removed and the diaphragm replaced. The focus point will be exactly in the center of the diaphragm.

The next service that this little device will render is that of properly placing the Roentgen tube. The brass

Fig. 1.—Roentgen tube focus finder and ray localizer.

tubing when placed in position will always occupy the position and indicate the direction of the most central bundle of rays. By this means this central bundle of rays can always be directed through the most important part of the body under examination, in the direction desired, and on the central part of the plate. All who have used the diaphragm technic have been disappointed to find that at times they did not have the part of the body on the plate that they expected, either because the focus was not central or because the oblique direction was miscalculated.

I have found this simple device of great value and trust that it will be equally valuable to others. It is of especial service in oral surgery, because small sharp fields are desirable and an oblique illumination is often necessary.

My work in connection with stomatology has been more particularly on the bones, or position of the teeth, and the accessory cavities, rather than a detailed study of the structure or the minute condition of the teeth themselves. For this reason I have found plates more useful than the small film which is placed in the mouth. The film is, however, most important, and when it can cover the desired field it will usually give greater de-

* Read in the Section on Stomatology of the American Medical Association, at the Fifty-eighth Annual Session, held at Atlantic City, June, 1907.

tail than the plate. The plate gives a larger field for study and comparison of the abnormal with the normal and it gives more of an idea of the relation of the parts.

By careful technic I believe that every portion of either jaw can be clearly shown on the plate. To show the angle of the lower jaw, with the condition of the bone and the three molars and two bicuspids, it is best to place this side on the plate, stretching the neck as far as possible. Then the Roentgen tube should be placed eighteen inches distant and the rays thrown obliquely between the angle of the jaw and the spinal column. This will project the opposite jaw out of the field, and we have only the one jaw clearly on the plate.

Now to show the anterior quarter of the lower jaw which will unite with the section previously described, this portion is placed on the plate; the head is slightly twisted to the opposite shoulder. The rays are passed between the spinal column and the angle of the jaw.

Fig. 2.—Roentgen ray localizer attached to table or diaphragm.

To obtain good definition of the posterior portion of the upper jaw, a position very similar to the one described for the angle of the jaw is used, except that the head is thrown farther forward, and the rays are directed more obliquely upward.

To Roentgenograph the anterior portion of the upper jaw, this portion is placed on the plates and the rays are passed forward just below the mastoid process of the opposite side. This position may also be used to study each antrum separately. Ordinarily, however, to determine the condition of the antrum of Highmore a Roentgenogram is made of both sides at once by passing the rays through the head antero-posteriorly. The face is placed on the plate, resting it on the forehead. The rays are then passed through the median line of the body and just below the level of the mastoid process.

CLINICAL APPLICATION OF THE RAYS.

Ordinarily the rays are used in diagnosing or differentiating malposition of the teeth, unerupted teeth, impacted teeth, dental spurs, retained roots, and exostoses growing from the roots of the teeth and thus making extraction difficult.

Necrosis of the bone, whether this originates about the root of a tooth or is due to some general condition, can be clearly shown. The recognition of the exact lines of fractures and their relation to the adjacent teeth often have an important bearing on the treatment. For instance, one of Dr. Schamberg's patients came with the history and the appearances of an abscess of the jaw with no history of traumatism. Roentgen examination showed a fracture of the jaw, with an abscess at the root of the tooth which was wedged in the fracture. Here a poor result and the later discovery of the fracture might have been embarrassing. When we have the signs of root abscess, it is important to find exactly the source of the infection, so as to save time, tissue and suffering.

The study of the condition of the antrum of Highmore can best be done by this means. If the antrum is found filled with pus we can often determine the source of the infection. Tumors also can be demonstrated in this region, as I illustrated by the case of round-celled sarcoma, which almost filled the antrum and which grew downward from the ethmoid cells.

The diagnosis of malignant disease of the maxillæ is often difficult, and any assistance that can be obtained is a step in advance. Malignant disease usually gives some increase in the size of the bone, and in addition to this there is at first some disturbance of the arrangement of the bone trabeculæ and later actual destruction of the bony substance. The differentiation between an abscess and a rapidly growing neoplasm will not always be easy clinically, but Roentgenologically an abscess will usually show some destruction of the bone early, while this is not likely to be true in a neoplasm.

In conclusion, the Roentgen examination should be used in the diagnosis of every obscure condition. It should also be used to determine exactly the extent of disease even when the general diagnosis is clear. By following this rule much embarrassment and much suffering will be avoided.

DISCUSSION.

DR. G. V. I. BROWN, Milwaukee, Wis., protested against using radiography in diagnosis, to the exclusion of diagnosing by means of the senses. He stated that the practitioner should be able to diagnose a large proportion of all these cases by the use of proper diagnostic methods, and that he ought to develop his skill in that direction.

DR. G. E. PFAHLER, Philadelphia, stated that the radiographs he presented were not intended to supersede diagnoses by means of the senses, but that they were intended as an aid in diagnosis and as confirmatory evidence where doubt existed.

Hospital Floors.—Charles J. Fox, in *Yale Medical Journal*, November, 1907, states that in the construction of the modern hospital too great importance can not be attached to the subject of floors. In spite of the present-day system of thorough ventilation, the isolation of the kitchens, laundries and closets, the immediate removal of all dirt of every character, the frequent use of disinfectants and the sterilizing of all instruments, the hospital can not be sanitary unless it is provided with an aseptic floor. The wooden floor so common in many of our finest hospitals is not only quite out of keeping with the sanitary arrangements of the building, but is a positive danger from the fact that it becomes a harbor for micro-organisms and infectious growths of all kinds.