

FIG. 237.—Radiograph of Thoracic Aneurism.

scopic work emphysema is a boon and a blessing, for it renders the cardiac outlines more distinct than usual. Hence, for determining the size and position of the heart in such cases, the *x*-rays give



FIG. 238.—Right-sided Pneumothorax seen from Behind. The collapsed right lung is seen against the spinal column and surrounded by an unnaturally bright area corresponding to the empty thoracic cavity. The shadow of the heart appears vaguely on the left side of the spine.

genuine assistance, as they also do when mapping out the heart in women with large breasts and fat chest walls.

3. *Central Pneumonia*.—Williams and others have succeeded in identifying foci of solidification beneath the surface of the lungs when no other physical signs could be obtained. It must be re-

membered, however, that congestion of the lung, œdema, atelectasis, and pleural thickening produce shadows similar to those of solidified lung.

4. *Tuberculosis*.—It is still a matter of doubt whether tuberculous foci can be recognized by the fluoroscope before the disease has progressed sufficiently to produce localized râles, diminished breath sounds, or restriction of Litten's phrenic phenomenon.

Slight opacities have been noted in cases which later turned out

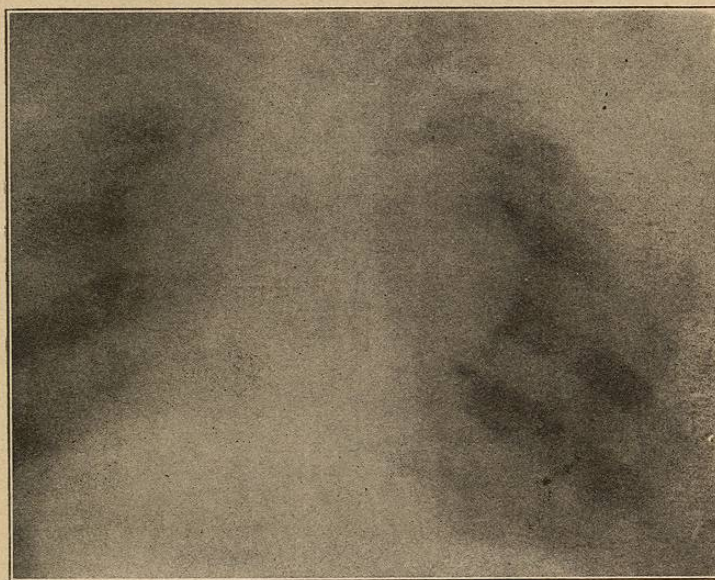


FIG. 239.—Aneurismal Sac, Radiographed from Behind.

to be tuberculosis, and which had not previously been diagnosed, but the shadows perceived by the fluoroscope are capable of many interpretations and correspond (as above said) to various pathological conditions. Old quiescent foci may appear like advancing lesions and thus lead to serious errors. We do not want to hurry a patient off to Colorado or Davos on account of the shadow thrown

by a long-healed lesion. Further, in some cases of rheumatism, anæmia, debility, and convalescent typhoid, appearances very similar to those of tuberculosis may be found (Williams). Hence the interpretation of slight lung shadows in cases of suspected incipient phthisis is by no means easy.

Advanced phthisis renders the lungs relatively opaque to the

Aneurismal sac.

Heart.

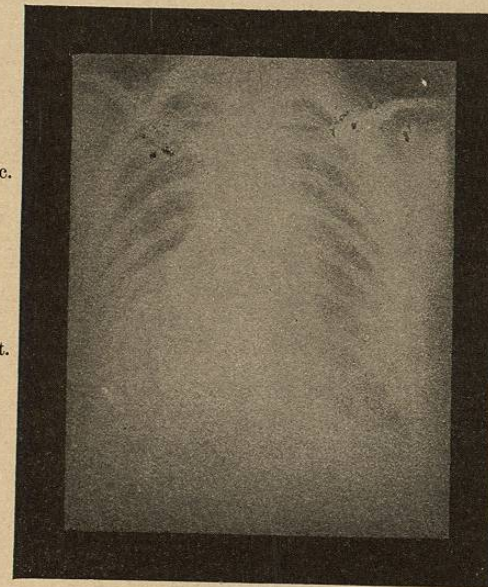


FIG. 240.—Aneurismal Sac Radiographed from Behind.

Roentgen rays except where extensive excavation has occurred; here we see a light area in a dark background.

No satisfactory radiographs of cases of *incipient* phthisis have so far been published, so far as I am aware.

5. *Pleuritic Effusions*.—The displacement of the heart is sometimes better shown by the *x*-rays than by ordinary methods of examination, since the compensatory hypertrophy of the sound lung,

which interferes with percussion and palpation of the heart, renders radioscopy easier.

The fluid exudate intercepts the rays perceptibly, and when the movements of the diaphragm are not abolished on the affected side, the line corresponding to the surface of the fluid can be seen to move up and down with respiration.

Small fluid accumulations flatten the normal curve of the upper surface of the diaphragm by filling up the chink between the inner surface of the chest in the axilla and the line of the diaphragm at that point.

6. *Emphysema*.—The lungs become unusually transparent and owing to the low position of the diaphragm the heart descends and assumes a very vertical position ("ptosis of the heart"); these points are very clearly seen with the fluoroscope.

Radiographs.

But little use has thus far been made of radiographs in studying diseases of the chest. The movements of the heart, of the chest walls, and of the diaphragm render all the outlines indistinct. For aneurisms, especially those containing a thick layer of clot, and for intrathoracic tumors, radiographs may be very useful, and bronchial lymph glands are sometimes rendered visible.

APPENDIX E.

THE SPHYGMOGRAPH.

This instrument consists of a system of levers by means of which the pulsations of the radial artery are transferred to a needle whose oscillations can be graphically recorded upon a piece of smoked paper. It is a very fascinating little toy, but in its present form is almost devoid of practical usefulness owing to the impossibility of eliminating the personal equation when using it. The size and, to a certain extent, the shape of the wave traced upon the smoked paper can be influenced at will by the amount of pressure with which the instrument is applied to the wrist. If an instrument is

applied with a pressure of three ounces to the wrist of A, and then with the same pressure to the wrist of B, the force exerted upon the artery may be quite different in the two cases owing to the different shape of the wrist in the two individuals.

Almost any type of tracing can be obtained from a normal pulse by varying the pressure.

This objection is fatal to the use of the sphygmograph as an instrument of precision, and although it is capable of recording tiny secondary waves unpalpable by the fingers, it has yet to be shown that it reveals anything of practical diagnostic value which is not appreciated by skilled fingers. For these reasons I have given no account of the instrument in the body of this work.