greater than the above, the kidneys are thrown out of action and all the excretion is performed by the intestine, until a point is reached where the quantity in the blood is again brought below the "toleration point," when the kidney again takes on its excreting function.

4. If the concentration in the blood is greater still, the calcium is excreted also as calcium soap by the intestine.

5. The excretion of large quantities of calcium through the intestinal walls has an astringent action, and causes diminished action and paresis of the intestinal movements. The faeces cease to be excreted so freely, and if more calcium arrives in the blood the increased concentration of the calcium ion produces spontaneous intravascular clotting and death.

6. The calcium "toleration point," or the point of concentration of calcium in the blood above which the kidneys are unable to act, can be raised by injecting increasing doses of calcium chloride into the blood, provided time is given for the animal to complete the excretion of one injection before the next is given. This action appears to extend the theory of immunity into the inorganic world, and shows that the body can react to calcium salts much in the same way that it reacts to an organic toxin.

AN APPARATUS FOR X-RAY LOCALIZATION.

BY

WILLIAM COTTON, M.D.,
BISHOPSTON, BRISTOL.

IN view of the present interest in this matter I have sketched (in isometric perspective) an apparatus with many familiar and some novel details. This is adapted for almost any of the prevailing methods of localization and for any part of the body, except perhaps the orbit. Any form of upright tube stand, if not too elaborate, will do; nor is any special table required, provided it is level, narrow, long, straight-edged, and transparent to x -rays. More particularly I would call attention to the plate-holder, which consists of an upper and a lower deck, connected similarly as in the case of the two beams of the ordinary parallel rulers, and capable either of being clamped in any position or of being used free. The lower deck can be slid along either edge of any straight table, and, being reversible, can be applied to the table from either side or end, and is not any obstacle to the passage of x rays. The upper deck can, by means of adapters, support any plate or fluorescent screen, so as to slide from either side of the table to the other. On the fluorescent screen and in close contact with its surface can be placed a widely overlapping sliding protective glass shield (in sections if preferred) of lead-glass, slightly sand-blasted or otherwise roughened on its upper surface, and sufficiently optically transparent to act as a temporary recording surface for outlining the shadows by means of a lead pencil when the screen is lit up. This recording surface being much more extensive than the fluorescent screen, permits the position of the points of the plumb-bob upon it to be marked irrespective of the actual place of a , perhaps, small fluorescent screen, and at the same time provides some protection for the hands of the observer; the pencil marks can afterwards be washed off.

O_1 and O_2 are the first and second positions of the x -ray centre of emission, constituting the Base and parallel to the plane of the fluorescent screen, which plane is always horizontal if the surface of the table is so; x_1 and x_2 are the two points indicated by the successive positions of the point of the plumb-bob, where the vertical x rays cut the picture plane, constituting the base on the plate; and m_1 and m_2 are respectively the first and second positions of the shadow of a foreign body thrown from O_1 and then from O_2 . If on the recording surface of the shield when the light is turned on we mark the points x_1 and x_2 and join x_1 with m_1 and x_2 with m_2 we get a sort of x -shaped figure; the point of intersection is the crucial point p . If the plane of the upper deck is truly horizontal and the plumb-line correctly centred over the x -ray centre of emission (as can be done once for all in various ingenious ways), then we know that the centre of the geometrical space occupied (but probably not completely filled) by any foreign body M is always in the vertical line $P M$ below p . The distance $p M$ is the depth of this "meta-

centre" of the foreign body below p and within the patient. By means of a free plumb-line we can now mark the point on the patient vertically below p , noticing carefully at the time the depth (if any) between the surface of the patient and the point p at the level of the upper deck. We can now dismiss the patient until he is wanted for operation.

To get the depth $p M$ we have only to plot out one or other of the triangles $O x m$, and mark in the position of p in some of the ordinary well-known ways. It is wise always for the radiographer to add half an inch or more

to the depth $p M$, once he is sure of his vertical direction, when he knows he is dealing with any irregularly shaped foreign body of any size much larger than a small shot or fragment. With an undistorted service bullet the surgeon may be safely left to make his own correction.

A good deal of the apparatus depicted can be improvised with the resources necessarily present when an x -ray installation can be installed and worked. As a rule existing practice prefers to get the point x and m , over each other and to ignore p as a separate entity; this also can fairly easily be done by means of this apparatus. I and II indicate the first and second positions of the brackets bearing the tube box and the plumb-line.

SANITATION OF CAMPS (SAND AND WATER).

BY

MAJOR T. FORREST, R.A.M.C.(T.),
S.M.O., GAILES CAMP, AYRSHIRE.

AN outbreak of diarrhoea in two companies of the 16th (S.) Battalion H.L.I. on December 16th, 1914, when ninety men were affected, caused an investigation to be made. Complaints as to the quality of the water supply had already been noted, and the valuable assistance of Dr. R. M. Buchanan, City Bacteriologist, Glasgow, was obtained. The water was, however, ruled out, as the number of men affected was only a fraction of the whole number using the same water supply. The same process eliminated the food supplies, which are daily inspected, and invariably of excellent quality.

In the search for evidence of local contamination it was found that the camp kettles were being scrubbed with sand picked up indiscriminately. Clean sand was provided, and orders issued that it only was to be used for scrubbing purposes. Thereafter no further cases occurred.