

THE PROJECTOR IN SURGERY.

The operating rooms of our hospitals are commonly arranged with a bank of seats at one side for the accommodation of students who desire to witness the operations. Situated thus to one side, and at some distance from the operating table, the students cannot see much of the actual manipulations of the surgeon, and have little or no opportunity to study his technique. The favorite few who are allowed on the floor are more fortunate, but even they are obliged to peer over the shoulder of the surgeon, and dodge the attendants, in their effort to witness the operation. Furthermore, they are apt to prove quite a hindrance to the operating surgeon. With a view to lessening the students' difficulties, the bank of seats in some operating rooms is made very steep, so that from the upper tiers the students can look over the heads of the surgeons and attendants, and thus obtain what practically amounts to a bird's eye view. But there is a serious objection to such amphitheaters. Dust is the surgeon's greatest enemy; for on its wings disease may be carried into the open wound and infect the patient. It is bad enough to have a body of unsterilized students in the operating room. But when they are perched high up above the patient, the scuffling of feet or even the slightest motion of the body will dislodge dust, which is quite liable to settle down on the region of the operation. The danger of infection increases directly in proportion to the number of persons in the operating room. And on this account many prominent surgeons will not permit students to witness their operations.

In order to enable the embryo surgeon to study the work of the skilled masters in the profession, although debarred from the room, Dr. Charles H. Duncan, who is prominently identified with St. Gregory's Hospital in this city, has devised an apparatus which, without interfering in the least with the operating surgeon, will project a bird's eye view of the operation on a screen in the next room. This projection will show the work life size or larger, if desired, and a lecturer may explain the operation as it progresses without disturbing the surgeon.

The general construction of this apparatus is shown in the accompanying engraving. About 18 inches above the heads of the operators is a large disk, fitted near its periphery with a series of electric lights. There is a large central opening in the disk, over which is an inclined mirror adapted to reflect the scene below into a second vertical mirror, which in turn reflects the light into a lens. The latter focuses the scene upon a suitable screen in the adjoining classroom. Two mirrors are required, so as to project the image right side around. Their arrangement is shown in plan in the small line drawing. The students are sep-

arated from the operating room by a wall or sound-proof partition, and in an opening in this wall the screen is located. Projecting through the wall is a hand wheel, which permits of focusing the screen,

lamps throws a strong light on the patient, so that the image cast on the screen is perfectly distinct.

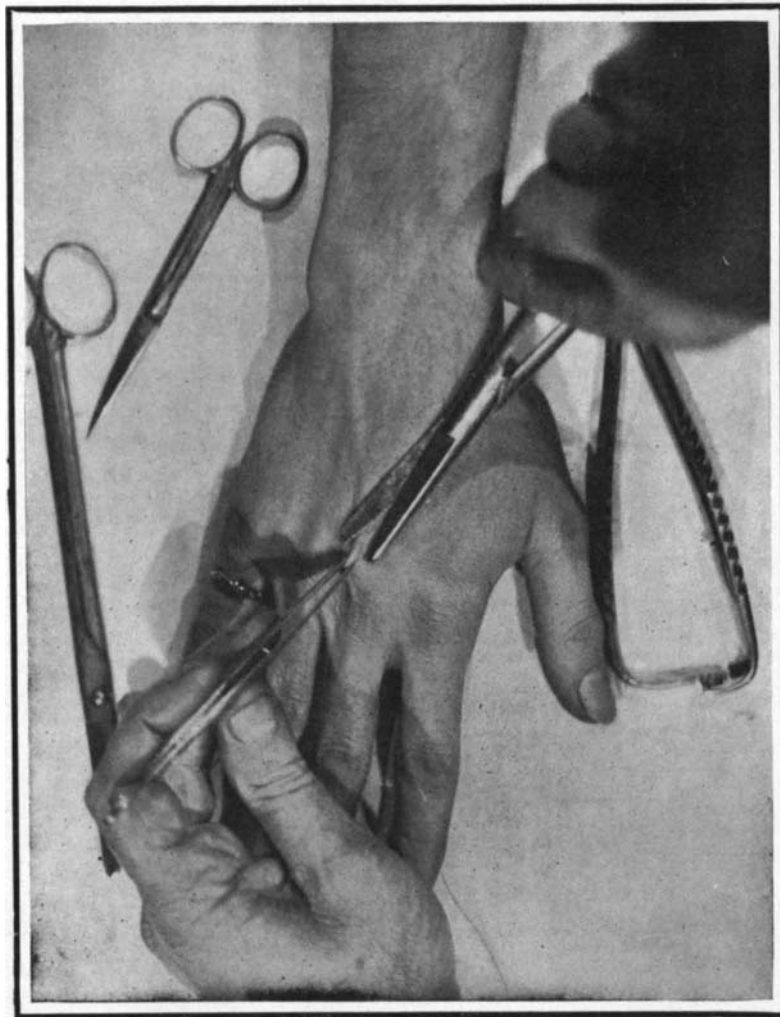
The students can witness every movement of the surgeon, and study in detail his methods of performing the operation, or respecting the feelings of patients who are sensitive to the gaze of the young doctors, the screen can be curtained off to show only the part operated upon.

Of particular value is this apparatus for taking photographs of surgical operations. When the surgeon comes across an interesting or rare phenomenon, a photograph of the same may be taken, making a record which can be preserved for future lectures or treatises. Dr. Duncan has tested his apparatus in an experimental way, and the accompanying illustration of a hand is reproduced from a photograph, taken by exposing a sensitive plate at the point where the screen is located. Heretofore the fear of infecting the patient has hampered the use of the camera in making records of operations. At Johns Hopkins University some successful photographs have been taken of important operations; but the utmost precautions had to be observed, to prevent dust from being dislodged from the overhanging camera, and infecting the patient. With this apparatus there is no such danger, because the portion that overhangs the scene of the operation is fixed and permanent, while moving parts, such as the shutter, the diaphragm stops, the plate holder, etc., are either located to one side, or else are situated above the disk in which the lights are contained.

One of the most important advantages of this system is the fact that moving picture records can be made of important operations. At present, when a great surgeon dies, his technique dies with him; for there is no way of graphically preserving to posterity the methods he pursued. But by means of a moving picture film, an invaluable record of his work could be preserved for all time. A surgeon who was called upon to perform a rather unusual operation could study the moving picture record of the work of noted surgeons in similar cases, and thus prepare himself to perform the work to better advantage.

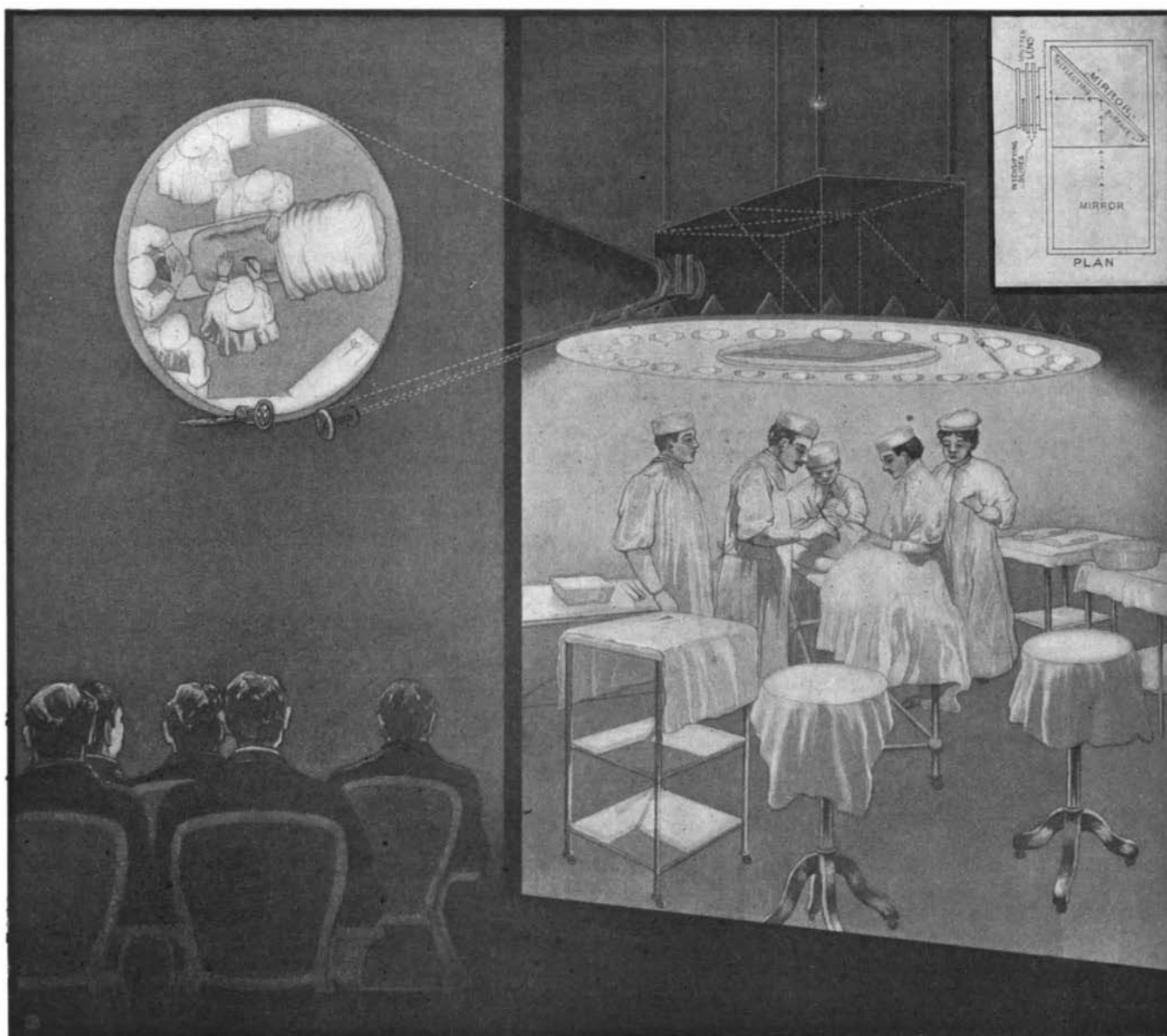
A New Method of Identifying Criminals.

A novel method of identifying criminals with absolute certainty has been devised by Professor Tamassia. When comparing the veins on the back of both hands, a striking diversity will be observed. Far more important, however, are the differences noted in the hands of different persons. In order to cause the veins to stand out more distinctly, the wrist should be bandaged for a short time. Their courses can then be photographed. Owing to the size of the hand, it is far easier to discover slight diversities than in minute prints of finger tips. Nor can any voluntary alteration of the vein tissues be feared, unless the hand be seriously injured.



Photograph of an operation taken by means of the projector.

while another hand wheel is arranged to allow of throwing color slides before the lens, permitting the lecturer to intensify such colors as will show up the various parts more clearly. The ring of incandescent



The projector permits students to witness surgical operations without entering the operating room.