

DISTANCE PHOTOGRAPHY.

In the annexed illustrations we represent a few photographs taken from "Prometheus," to show the wonderful results obtained by Dr. Adolf Miethe's new camera with a teleobjective.

The objective of this apparatus consists principally of a convex lens of considerable length of focus and a concave lens having short focus. The two lenses are placed a distance apart corresponding to the difference of the two foci. According to optical laws, this arrangement projects an inverted image of an object located a considerable distance from the convex lens. The size of the image varies according to the distance the lenses are held apart, and becomes larger on moving the lenses toward each other; the size of the image also depends on the relative proportions of the foci of the lenses; that is, the greater the difference between the foci, so much larger is the projected picture, the conditions being otherwise the same. For instance, if the relation of the foci is 25 to 1, the pro-

the rectangularly arranged black lines in Fig. 1 corresponds with the detail picture of Fig. 2.

For taking the picture shown in Figs. 3 and 4, the camera was placed about 400 yards from the object, a river with a bridge and brewery in the background. The picture shown in Fig. 3 was produced with an ordinary objective, and the part inclosed in the black lines forms the subject of the detail picture illustrated in Fig. 4, and was taken with the tele-objective.

By a careful comparison of the pictures of the two sets, it can be readily seen that the contours of the pictures remain the same, and hence the camera could not have been moved nearer to the objects for taking the pictures shown in Figs. 2 and 4. T. G. H.

The Risks of Leather Workers.

There is a process of softening the leather used for saddlery which is very injurious to the health of the workmen engaged in the craft. M. Etienne Ferrand, of Lyons, has recently brought forward proposals for

of rubbing superheated tallow into the skins by hand labor, the skins should be placed in stoves with tallow maintained just in a state of liquefaction—namely, from 100° to 120° C. No irritating vapors would then be produced. If it was found that the liquid tallow did not sufficiently permeate the skins, the rubbing by hand could be replaced by rollers or other methods of bringing to bear mechanical friction. M. Ferrand touches, however, upon the real difficulty when he suggests that tallow costs 80 c. the kilogramme and leather 3 fr. 50 c. the kilogramme. By the hand process the workmen are able to introduce so much tallow that the grease in the leather represents from 35 to 45 per cent of the total weight. For doing this the workmen receive a supplementary wage of 3 fr. per day, which, added to their ordinary wage of 5 fr. a day, makes a very considerable difference. Doubtless if some such method as that suggested by M. Ferrand were applied, good leather could be made without any inconvenience or risk to health. But the leather,

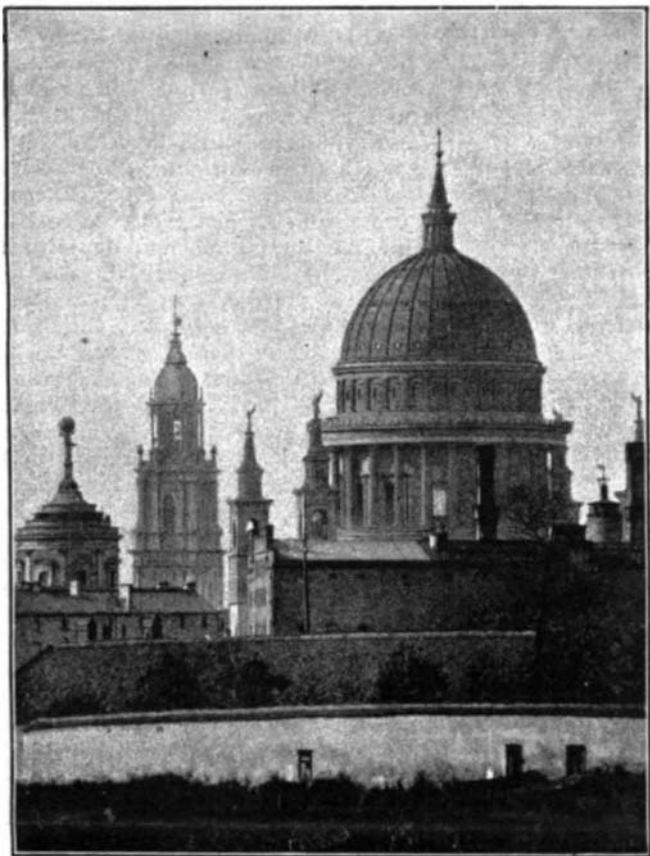


Fig. 2.—DETAIL VIEW OF THE PART INCLOSED IN BLACK LINES, Fig. 1.



Fig. 4.—DETAIL VIEW OF THE PART INCLOSED IN BLACK LINES, Fig. 3.

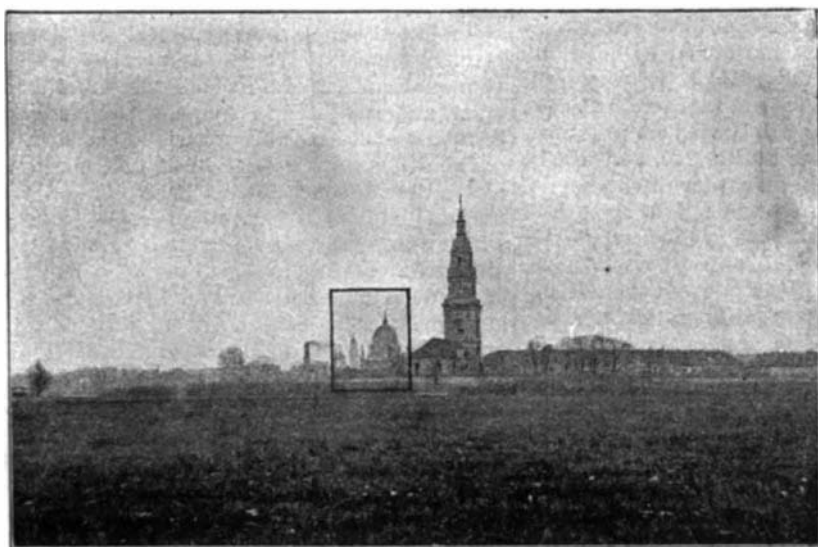


Fig. 1.—VIEW OF POTSDAM, NEAR BERLIN.

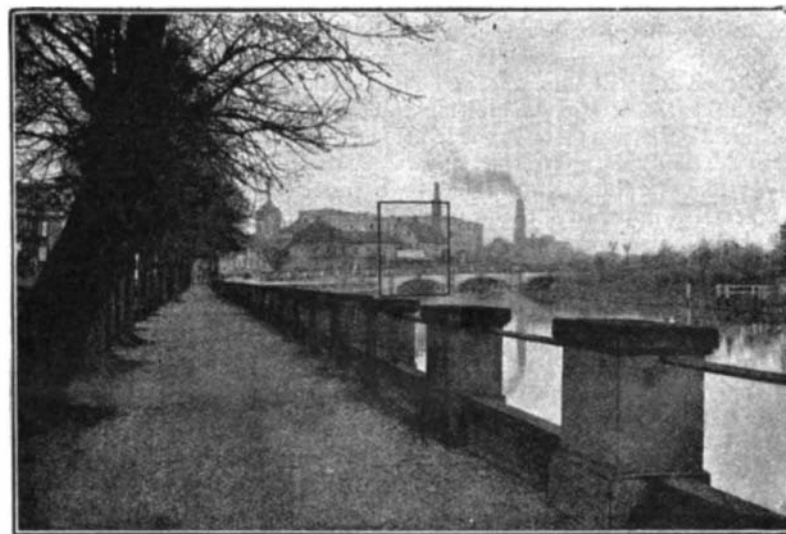


Fig. 3.—VIEW OF A RIVER WITH BRIDGE AND BREWERY IN THE BACKGROUND.

jected pictures are about twenty-five times as large as those projected by an ordinary lens, the distance of the object from the camera being the same in both cases.

In order to produce photographic pictures of a high quality by such a system of lenses, the lenses must necessarily have a special form and rendered achromatic by using crown and flint glass in the usual manner. The entire apparatus looks very much like a Galilean telescope.

By substituting an ordinary opera glass for the objective on the camera, and drawing the bellows out as far as possible, a fairly good picture of a distant object will be produced on the ground glass of the camera.

The pictures shown in the annexed engravings were taken by the same camera placed in Figs. 1 and 2, about two miles from the object, the city of Potsdam, near Berlin. For Fig. 1 an ordinary aplanatic objective of 5¼ inch focus was used, and for Fig. 2, Dr. Miethe's tele-objective above described and with the camera drawn out to 10 inches. The part inclosed by

remedying this evil. After the leather has been tanned, but prior to its being rendered supple and before it is scraped and polished, grease has to be rubbed into the pores. The entire skin before it is cut is heated and thoroughly dried in a stove. The skin is then spread upon a table, and tallow at a temperature of about 250° C. is poured upon the leather. The workmen rub this melted tallow into the pores of the skin. But the tallow when heated to this extent gives off acrid vapors, which irritate the respiratory organs and occasion much suffering to the workmen. This is due to the presence of acroleine in the vapors, produced by the decomposition of the glycerine. The acroleine, when coming in contact with the air, forms acrylic, acetic, and formic acids, and is readily volatile at ordinary temperatures. A few drops of acroleine volatilized in a room will render the atmosphere almost insupportable. For this reason, workshops and factories where leather for saddlery is made are put by the French legislature in the second category of unwholesome industries. M. Ferrand proposes that, instead

though equally strong, would not be so heavy, and the workmen would lose their claim to a supplementary wage. Therefore both employers and workmen are opposed to the more wholesome process. M. Ferrand is more likely to be supported by the trade when he urges that in any case there should be, by the side of the workshop where the tallow is rubbed into the leather, a spare room, well warmed and ventilated, where the workmen could seek rest and fresh air between each operation. To this the workmen at least would not object, but the employers would probably complain of the extra expense involved. It seems deplorable that the health of the workmen should be gravely compromised for the sake of increasing the weight of leather by forcing into the pores more grease than is necessary.—*The Lancet*.

BLOOD travels from the heart through the arteries ordinarily at the rate of about twelve inches per second; its speed through the capillaries is at the rate of three one-hundredths of an inch per second.