

LXXXI.—*A New Photographic Phenomenon.*

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ALTHOUGH the phenomenon here described has not yet been entirely elucidated, the present preliminary note appears to be justified by the results which have already been obtained. A sensitive photographic plate is placed, film upward, at the bottom of a light-tight box; on the film are placed two or more glass microscope slides, and resting on these supports is laid a negative, also film side upward. The box is then closed and is placed in the neighbourhood of a Bunsen burner, a bat's-wing flame, or an electrical kettle-heater. After an exposure of some hours, the plate after development shows an image of the negative. The resulting photograph is the reverse of the original negative, that is, it is a positive such as would be obtained by simple printing with sensitised paper in the usual way.

In the experiments made, the plates used have been Wellington Anti-screen, Imperial Extra Rapid and Imperial Sovereign makes, different batches of each kind having been employed.

The material of the box may be either wood or cardboard. Care has been taken that no light enters the box; certain of the experiments having been conducted in total darkness, whilst in other cases the openings between the two halves of the boxes have been carefully sealed. The results are obtained whether the box is left in the open air or is enclosed in an air-tight desiccator.

The nature of the source of heat appears to exercise some influence on the rapidity with which the effects are produced. Very poor results are yielded by a Meker burner; poor results are given by a Bunsen flame impregnated with calcium salts; with lithium or sodium salts, the effects are more strongly marked. The electric heater gives very good results when worked on its lower resistance.

The distance between the box and the source of heat has usually been about 30—45 cm., but on one occasion results were obtained with a box placed in a cupboard 180 cm. away from a sodium burner, although in this case the exposure was an extremely prolonged one.

The most striking peculiarity of these experiments is the fact that when the box is arranged so that the sensitive plate lies between the source of heat and the negative, the results are obtained just as sharply as if the negative had been interposed between the heater and the sensitive plate. Were direct-acting rays concerned in the matter, it seems clear that in these circum-

stances the plate would be fogged by their passage through it before they reached the negative at all.

The results are not due to any radioactive material in the neighbourhood, for one of us carried out test experiments in the laboratory of the Queen's University of Belfast, where no radioactive contamination exists, and the effects were obtained there also.

The effects cannot be ascribed to the negative having stored up light which it liberates again in the dark, for a parallel experiment made with a negative which had been specially illuminated for ten minutes within 15 cm. of a spectroscopic spark apparatus gave no results when no source of heat was present.

The rays which produce the effects on the sensitive plate appear to be similar in properties to light rays. Glass is practically transparent to them; inkstains, seccotine, and metal show different degrees of opacity. It has been found that the rays can be diffracted and refracted just like ordinary light.

The matter is being further investigated, but the foregoing is sufficient to show that an interesting field has been opened up.

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