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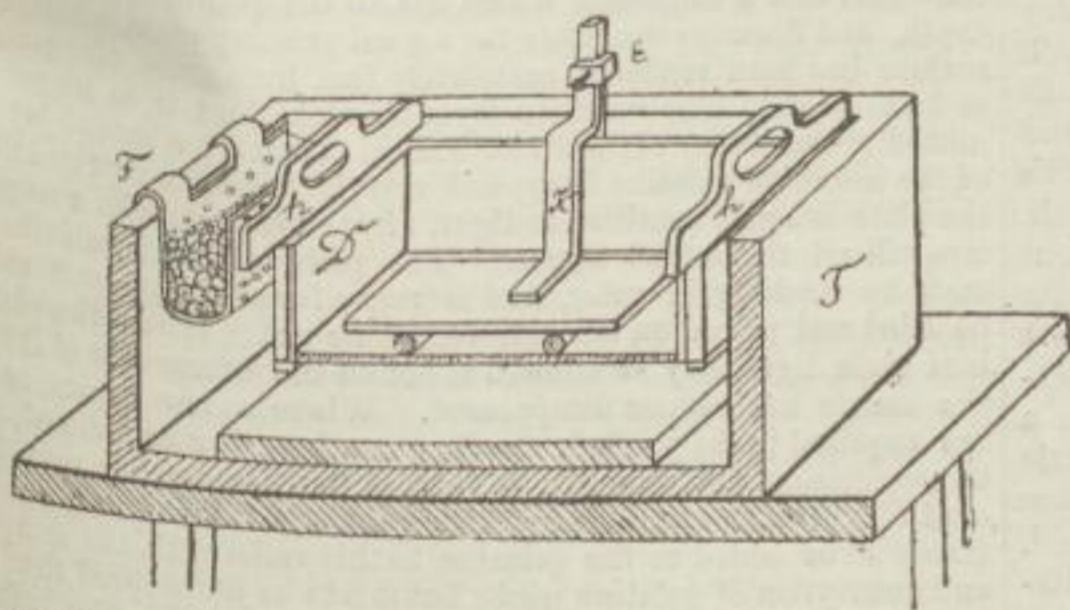
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THE PRODUCTION OF HELIOGRAPHIC BLOCKS BY ELECTROTYPING IN THE GEOGRAPHICAL INSTITUTE OF VIENNA.

In the map department of the Ordnance Survey of Austro-Hungary, at Vienna, the heliographic printing blocks are produced by a modification of the carbon process. A print upon sensitized tissue is obtained and transferred to a silvered copper plate, the necessary grain being obtained by quickly drying the bichromated film in a powerful air-current of ordinary temperature. From the pigment image in relief, with a grain thus imparted, and while it still adheres to its metal surface, another relief is made in the electrotyping bath.

Here is a sketch of the electrotype apparatus in use at



the Ordnance Survey Office at Vienna. The trough, T (see fig.), is a wooden box, lined inside with sheet-lead two millimetres thick, and coated with a suitable non-conducting compound. One very good mixture is the following:—

Stearine	3 parts by weight
Black pitch	6 " "
Linseed oil	3 " "
Gutta-purcha	20 " "

In the trough is suspended the diaphragm D, a wooden frame, which on both its narrow sides is fitted with handles, h h, for lifting the diaphragm in and out, but on its broader sides (lengthways) is furnished with projections or feet upon which it stands. The bottom of the diaphragm is of parchment, which is fastened on all four sides with wooden pegs and screws. Above the parchment is laid a piece of linen to prevent the impurities of the zinc or iron from falling upon the parchment.

The zinc or iron plate (positive electrode) is connected with the negative electrode by means of a strip or arch, K

(see fig.), of copper sheet, this being fastened by the clamp E. At the narrow end of the trough, at f, is a receptacle containing sulphate of copper.

In commencing work, a zinc plate is inserted in the trough as positive electrode, in order to precipitate as quickly as possible a fine and compact deposit of copper, so that the gelatine relief in the bath may not suffer from the free acid of the copper solution. The sulphuric acid used for the zinc is diluted with water in the proportion of 1 to 60.

After the lapse of an hour, the zinc plate is removed, and an iron plate substituted for it, the latter being immersed in sulphuric acid diluted to the extent of 1 to 27 of water.

The heliographic plates acquire their proper thickness after a period of from twenty to twenty-four days, when they may be taken out of the apparatus.

For coating plates with iron, three carbon-zinc elements are employed. It is best to employ, for depositing iron, a sal-ammonic solution, in which iron plates are laid as electrodes. The electric current is permitted to act until a sufficiency of subchloride of iron has been formed, and a mirrored surface of iron has been deposited.

Examples of heliographic plates produced in this way, as also some very fine impressions from them, were shown at the recent Brussels Exhibition, and also at the International Electric Exhibition at Vienna which has just closed.

PHOTOGRAPHIC CHEMICALS.

WHILST commercial plate makers are approaching nearer and nearer to uniformity in the rapidity and quality of their plates, amateurs are still complaining that they can seldom prepare two batches of emulsion alike. The small quantities which they prepare at a time has no doubt a great deal to do with this; but one of the chief impediments to their success may be found in the varying qualities of the chemicals to be obtained in the market, and the fact that the amateur buys them in small quantities at a time. What he very seldom does, too, is to test his chemicals before using them, and compare one sample with another. Though he may not be able to arrive at absolute certainty in the uniformity of his conditions of working, he may nevertheless more nearly approach to this even by comparatively rough tests. Apart from the vexed question of gelatine, which is always cropping up in one form or another, the variations in commercial articles are sufficient to produce important alterations in results.

The most important substance used, perhaps, is the bromide, and slight deviations from the purity of this salt