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PHOTOGRAMMETRY WITH ONE PHOTOGRAM EMPLOYING A CAMERA AND A PROJECTOR

We think it is possible to get from a photogram the data we generally obtain from 2 photograms if we project on the object, before the taking, a pattern of known geometry.
We can actually do the following observations:

a) projecting, from a point P_1, by means of a metric projector, a reticle, or other known plane pattern on an object, we shall get a deformed and spatial reticle; let's assume the reticle and the coordinates of its points in respect to the axes of the metric projector are stamped on the object;
b) if we have two takings from 2 different points, P_1 and P_2, of the deformed reticle, we can get a spatial reconstruction of it;
c) if the used camera and projector have the same optics, by the taking from P_1 we shall obtain the projected reticle. (Actually it is not strictly necessary that the camera and the projector have the same optics).

Thus, only one taking is necessary, namely from P_2: and we have, from every point of view, a stereoscopic pair of photograms of the spatial reticle and it will be possible to plot it, i.e. to plot the points of the object.
In fig. 1 we can see a stereoscopic couple formed by a photogram and a reticle (pseudo-photogram)(the couple, as said, also gives a stereoscopic effect).
For the plotting we can employ an analytical or analogical device. However the procedure can be much simplified: it is enough to consider that the coordinates of the projected points of the pattern (pseudo-photogram) are known; in normal taking, it is necessary to measure only one proper coordinate of the points of the pattern on the photogram in respect to its axes.
This technique, if suitably studied, will be able to give remarkable applications not only in the biostereometric field but in all cases in which it is difficult to recognize the corresponding points in a stereoscopic couple. It could be useful in dynamical problems or other ones too.

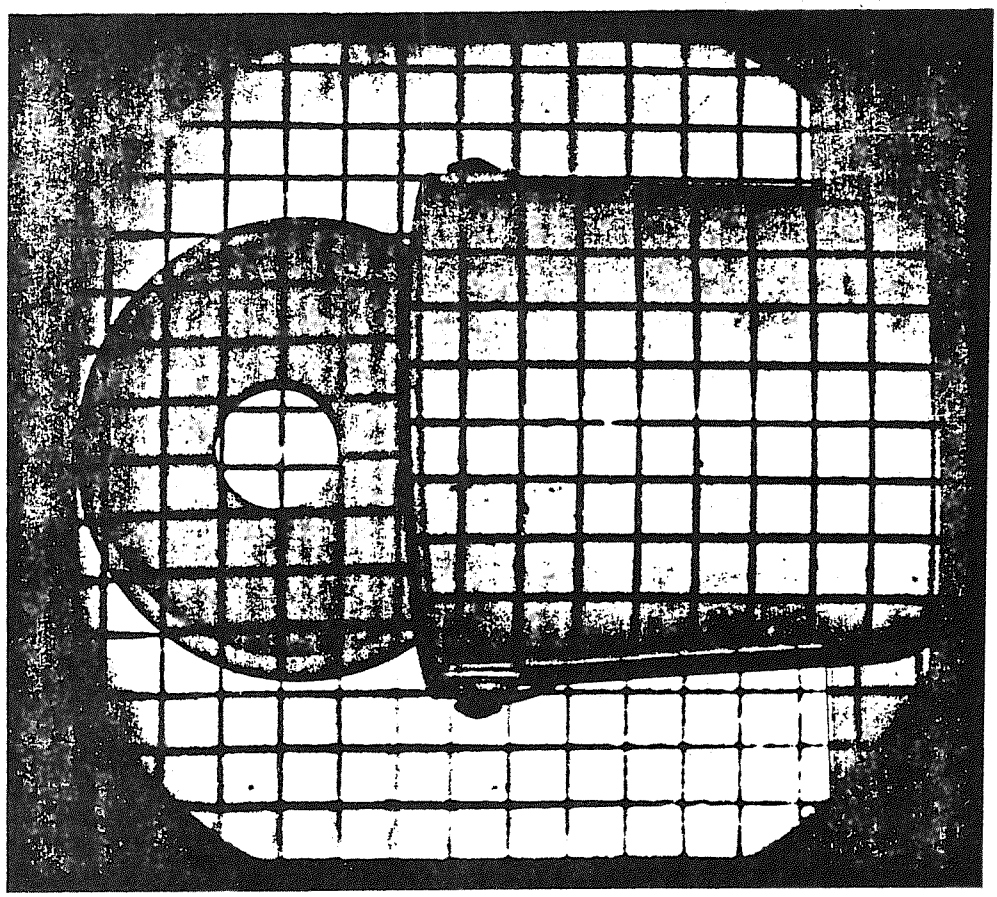
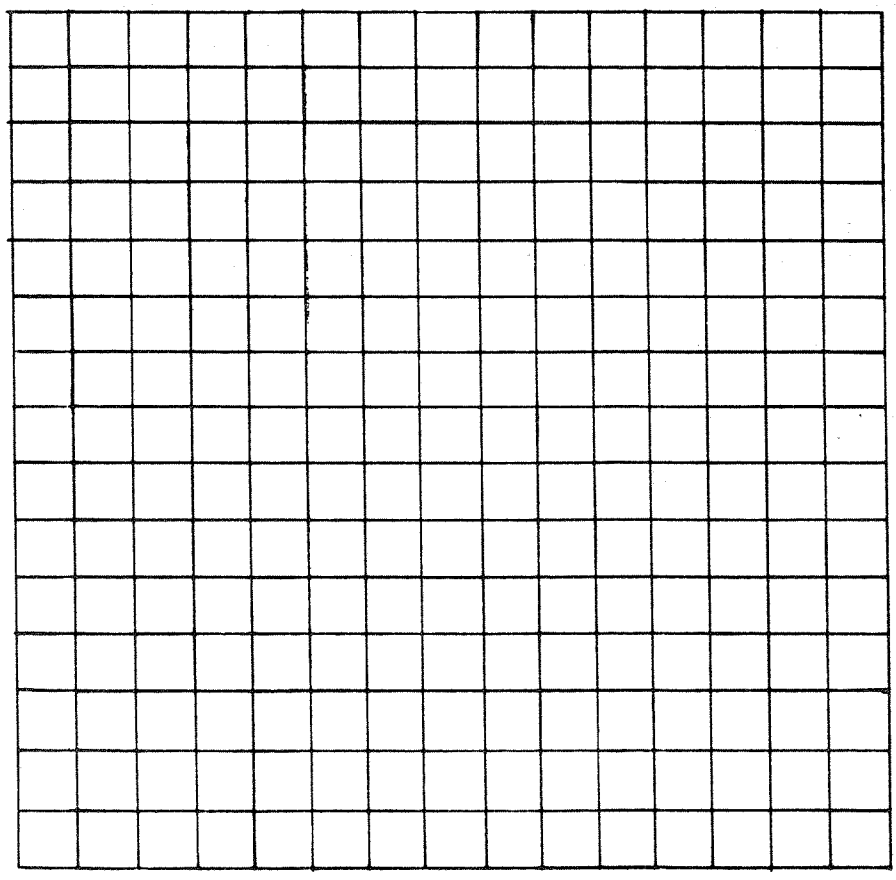
fig. 1