CORRESPONDENCE.

SUGGESTIONS FOR GEOLOGICAL SURVEYORS.

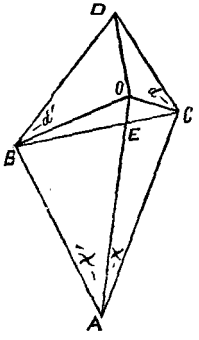
SIR,—The following proposition will, I venture to think, be found very useful to Geological and Mining Surveyors, for none of the text-books give any information on the subject. I hope, therefore, that you will be able to find room for it. F. W. HUTTON.

WELLINGTON, NEW ZEALAND,
6th August, 1873.

Given the dip on each side of an anticlinal or synclinal curve, to find the direction of the axis.

(*a.*) To find the bearing of the axis.

Let OC and OB represent the bearings of the two dips. From O erect the vertical OD. Make the angles OCD and OBD equal to the dip on each side of the curve. Draw CA at right angles to OC, and BA at right angles OB. Join AO and BC. Then CA and BA represent the strike of the beds on each side, and AO represents the bearing of the axis.



Let $\angle OCD = d$; $\angle OBD = d'$; $\angle OAC = x$; $\angle OAB = x'$; and $\angle BAC = A = x + x'$.

Then because OBE and CEA are similar triangles $\angle OBC = x$; and for the same reason $\angle OCE = x'$.

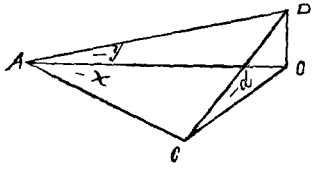
Also $CO = DO \cot d$
and $BO = DO \cot d'$.

Consequently

$$\tan \tfrac{1}{2}(x' - x) = \frac{(\cot d' - \cot d) \tan \tfrac{1}{2} A}{\cot d' + \cot d.}$$

by which x, and therefore the bearing of the axis, can be found.

(*b.*) To find the inclination of the axis.



Let, as before, AC represent the strike, and DCO the angle of dip (d) of the beds on one side of the curve. Join AD. Then AO represents the bearing of the axis, and DAO is its inclination to the horizon. Let $\angle DAO = y$.

$$\text{Then } \tan y = \frac{DO}{AO}.$$

$$DO = OC \tan d$$
$$AO = OC \operatorname{cosec} x$$

$$\therefore \tan y = \frac{\tan d}{\operatorname{cosec} x} = \tan d \sin x.$$

which gives the inclination of the axis with the horizon.

N.B.—The axis of an anticlinal curve will incline *downward* towards the angle formed by the two lines of strike, while the axis of a synclinal curve will incline *upwards* towards that angle.