geologists as a body are little interested in applications of their science, in this respect forming a marked contrast to chemists and physicists. At the present time, the posts open to graduates in geology fall roughly into four main classes: (1) appointments with mining and oil companies; (2) geological survey posts; (3) museum posts; (4) university appointments; and it is clear that the numbers and prospects of such posts are not such as to attract an increasing number of graduates in the near future. One of the chief factors militating against a change in this position is the present overweening importance attached in most quarters to the purely stratigraphical side of the science, to the exclusion of a linking up with other sciences such as chemistry, physics and engineering.

I think it is correct to state that there is not a single trained full-time geologist on the staffs of Government departments, such as the Road Research and Building Research Laboratories, and I find it difficult to believe that there is not an outlet or opportunity for a suitably trained geologist in work of that kind. I have found that the possible applications of the science in civil engineering and building problems are many, but that men who are suited to the study of these problems are not being produced by our schools of geology to-day.

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Application of the Polarographic Effect of Proteins in Cancer Diagnosis

THE investigations of E. Waldschmidt-Leitz[1] have shown that blood serum, similarly to blood itself[2], activates deactivated papain. Prof. E. Waldschmidt-Leitz[1] has also shown that normal blood serum induces in these ferments or in methylglyoxalase a greater activity than serum from carcinomatic blood. This activity is ascribed to the sulphydryl groups of the proteins of serum.

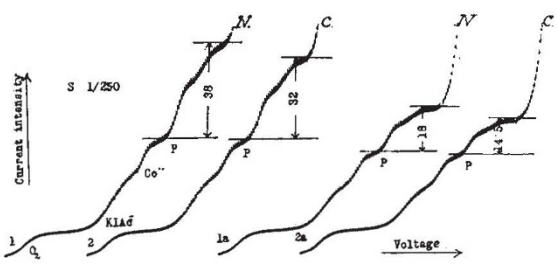

Fig. 1.

CURVE 1, NORMAL SERUM, 'WAVE' *P* 38 MM. HIGH. CURVE 2, CARCINOMATIC SERUM, 'WAVE' *P* 32 MM. HIGH. BOTH SERA WERE TREATED WITH ALKALINE IODOACETATE FOR 70 MIN. CURVES 1*a* AND 2*a* WERE OBTAINED WITH THE SAME SERA AFTER 250 MIN. TREATMENT.

Some years ago, I found a sensitive polarographic protein effect, conspicuously exhibited by serum, which I explained as due to the catalytic activity of the sulphydryl groups of proteins[3]. It seemed thus important to investigate the differences between carcinomatic and normal sera polarographically, by electrolysis with the dropping mercury cathode. In this way a method has been worked out, in which the sulphydryl groups of serum proteins are acted upon by iodoacetate in alkaline solution, and after a certain time the denatured serum is subjected to the polarographic investigation. In these experiments, 0·3 c.c. of serum, 0·15 c.c. of *N* potassium hydroxide and 0·3 c.c. of 0·2 *N* potassium mono-iodoacetate are mixed and kept at room temperature; after a certain time (about one hour) 0·1 c.c. is taken out and added to 5 c.c. of a solution consisting of 8×10^{-4} *M* cobalt chloride, 10^{-1} *N* ammonium chloride, 10^{-1} *N* ammonia. The polarographic curve of this solution is then recorded. The 'protein effect', consisting in the appearance of a characteristic 'wave' on the current voltage curve, is always found larger with normal serum than if in the same procedure carcinomatic serum is used (Fig. 1. Curves 1 and 2).

Another way which also leads to polarographic differences between carcinomatic and normal serum is to mix 0·3 c.c. of serum, 0·3 c.c. of water and 0·15 c.c. of *N* potassium hydroxide. After 5, 10 or 20 min., 0·1 c.c. of this mixture is added to 20 c.c. of the above cobalt solution, to be investigated polarographically. 67 different samples of various individuals were thus examined without knowledge of the clinical (histological) investigations, which were carried out by Prof. H. Knaus. 32 of these gave an abnormally low polarographic protein effect, and thus were reported as carcinomatic, in perfect agreement with the results of the medical examination and with the biochemical examination of Prof. Waldschmidt-Leitz.

Whilst the details of this investigation will be found elsewhere[4], it is mentioned here that the polarograms were obtained with Prof. J. Heyrovský's authentic polarograph, made by Messrs. Dr. V. and J. Nejedlý, Prague. A simple 'micropolarograph' suitable for medical routine work of this sort of research is under construction.

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[1] Waldschmidt-Leitz, E., Conrath, O., and Gloeditsch, J., *Naturwiss.* [Jan. 22]. Waldschmidt-Leitz, E., *Z. Angew. Chem.* (in the press).
[2] Purr, A., and Russel, M., *Z. physiol. Chem.*, **228**, 198 (1934).
[3] Brdička, R., *Collection*, **5**, 112, 238 (1933).
[4] Brdička, R., *Rozpr. Čes. Akad.*, II. tř (in the press). *Bull. intern. de l'Académie des Sciences de Bohême* (in the press).

Time Lag in the Vacuum Photo-Cell

IN a recent letter[1] Dr. R. A. Houstoun treats equally as vacuum photo-cells the *KMV*6 and the *KV*6, both of which are made in these laboratories. The *KMV*6 *is* highly evacuated, but the *KV*6 always contains an appreciable quantity of hydrogen evolved from the sensitized potassium; it should not be regarded as a true vacuum cell.

No experiments made in these laboratories throw any light on the question whether the difference between the two cells discovered by Dr. Houstoun is actually due to this difference in gas content. My object is merely to point out that this possibility should not be excluded from consideration.

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[1] NATURE, **139**, 29 (Jan. 2, 1937).