OH are: salicylaldehyde, *o*-nitrophenol and 2, 6-dinitrophenol, which have properties typical of chelated substances[2]; methyl salicylate and *o*-hydroxyacetophenone which, although not previously tested, are representative of Prof. Sidgwick's Type B[3]; and salicyl-α-methyl-α-phenylhydrazone and γ-diethylaminopropanol. While there has been no prior consideration of the last two compounds as chelated, in each of them the condition of a six membered ring is fulfilled, however, with nitrogen replacing oxygen. Benzoin and 8-hydroxyquinoline, which form chelated salts[4], give characteristic OH absorption, as also do ethyl lactate and diethyl tartrate. These last compounds apparently are doubtful cases of chelation; the first three require five membered rings and in the last one either five or six membered rings are possible.

Characteristic OH absorption was found in *p*-hydroxybenzaldehyde, *m*-nitrophenol, *p*-hydroxyacetophenone, *o*-chlorophenol, and 2, 4, 6-trichlorophenol, which were selected, from the OH compounds that we have examined, as non-chelated compounds comparable to the first five of the above mentioned substances. 2, 4, 6-Trichlorophenol is further of interest in that the OH group is so placed as to be 'sterically' affected in reactions. It is probable, for physico-chemical reasons, that neither these nor the preceding observations have been influenced by association since the solutions are of the order of 0·01 molal.

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[1] *J. Amer. Chem. Soc.*, **55**, 3574; 1933.
[2] *J. Chem. Soc.*, **123**, 2819; 1923.
[3] "The Electronic Theory of Valency" (London, 1929), p. 240.
[4] Ref. 3, p. 245.

Surface-force Theory of Crystal Rectification

EXPERIMENTS with Mr. A. K. Das-Gupta have shown that when carborundum, zincite or silicon crystal is placed between two mercury electrodes giving a large contact area, there is considerable rectification. Similar experiments with symmetrical crystals like iron pyrites, galena, etc., have shown no rectification. These experiments strongly suggest asymmetric conductance in crystals having no centres of symmetry. Accordingly, crystal detectors can be classified thus: (1) crystals having centres of symmetry, and (2) crystals having no such symmetry. In the symmetrical crystals, we observe rectification associated with point contacts. In the second group, in addition to this 'point'-rectification, there is *volume* rectification, due to asymmetric conductance. The object of the present note is to suggest a theory of rectification in the *symmetrical crystals*.

In an ionic crystal (like iron pyrites, galena, etc.), if we take a plane where *similar* sets of ions are placed at regular intervals, it is evident, if we consider the first layer and the next, that any ion on the surface has an unbalanced electrostatic force. When an alternating voltage is applied to the surface of a crystal where crystal planes parallel to the surface contain similar sets of ions, this electrostatic force on the surface would give rise to a unidirectional current. The crystal plane in the first layer may contain *all* positive or *all* negative ions. Both positive and negative rectification effects are therefore possible. In planes which contain oppositely charged ions *alternately*, the 'whisker' is in contact with a large number of such ions, thus giving, on an average, no rectification. This is what is actually observed in natural poly-crystals.

Of the two features in the current-voltage characteristic curves, namely, (1) asymmetry and (2) curvature, the first is explained in the symmetrical crystals in terms of the electrostatic force on the surface; the second is due to:

(1) local heating at the junction, as pointed out by Eccles[1], and

(2) the effect of strain on the crystal, as explained by Dowsett[2].

A small contact area for the 'point' rectification is necessary, because a large contact area means a large number of small contact points of varying degrees of rectification giving on the average a small effect. Besides, for some points, the contact resistance is extremely small, causing more or less a short circuit.

The surface-force theory can explain the following experimental results obtained in this laboratory:

(1) Rectification observed in the case of symmetrical crystals in contact with pointed crystals of the same composition. (Eccles's thermo-electric theory[3], and Schottky's electronic theory[4], fail to explain these results.)

(2) Decrease of rectification on heating the crystal.

(3) Decrease of rectification on heating the junction in the case of symmetrical crystals.

(4) Decrease of rectification on exposure to ultra-violet light and X-rays.

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[1] Eccles, *Proc. Phys. Soc.*, **22**; 1914.
[2] Dowsett, "Year Book of Wireless Telegraphy, 1922". (See also Dowsett's "Wireless Telephony and Broadcasting", Vol. 2, Ch. ii.
[3] Eccles, *Proc. Phys. Soc.*, **25**; 1915.
[4] Schottky, *Z. Phys.*, **4**; 1923.

Synthesis of Vitamin C by Luteal Tissue

MOURIQUAND and Schoen have shown[1] that gravid female guinea pigs on a scorbutic diet develop scurvy only very slightly or not at all. They considered that the fœtus was capable of synthesising vitamin C, and thus protected the mother from incurring the disease. Afterwards, Rohmer, Sanders and Bezssonoff[2] and Rohmer, Bezssonoff and Stoerr[3] showed that the young human infant, up to the age of five months, is capable of synthesising vitamin C.

It appears from these results, therefore, that the fœtus almost certainly synthesises vitamin C in fairly large amounts. It is known that the corpus luteum possesses a high concentration of the vitamin in its cells, and the question arises whether presence of the vitamin in this situation is the result of its manufacture by the fœtus, or whether it is the result of the intake of vitamin C in the food.

It was decided to endeavour to create a corpus luteum in an experimental animal with the aid of the luteinising hormone of the anterior pituitary, in order to ascertain whether this would protect the animal from scurvy induced by a scorbutic diet.

The chief difficulty was in the choice of animal.