# LETTERS TO THE EDITOR

## The "Ninhydrin-Reacting" Hydrolytic Fragment of Vitamin $B_{12}$ and 1-Aminopropan-2-ol

SIR,—Ellis, Petrow and Snook[1] have previously reported that hydrolysis of vitamin $B_{12}$ gives rise to a "ninhydrin-reacting fragment" not identical with any of the known amino-acids. Later work[2] led to the conclusion that the ninhydrin-reacting fragment was a volatile aliphatic base and, in all probability, an amino-alcohol. This view was strengthened by the observation that 2-aminopropan-1-ol and the ninhydrin-reacting fragment exhibited the same behaviour on paper chromatograms irrigated with four different solvent systems. Nevertheless, while drawing attention to this fact, Ellis, Petrow and Snook[2] pointed out that a final decision must rest on a rigid chemical comparison between the two compounds.

Subsequent work by Cooley, Ellis and Petrow[3] revealed a difference in the behaviour of 2-aminopropan-1-ol and the ninhydrin-reacting fragment on oxidation with acid permanganate. Microgram quantities were employed for these experiments, the products obtained being examined on chromatograms developed with the ninhydrin reagent. 2-Aminopropan-1-ol gave alanine under these conditions. The ninhydrin-reacting fragment, in contrast, gave an unidentified product which appeared as a yellow spot slowly turning purple at room temperature.

In continuation of this work, we have investigated the chromatographic behaviour of several amino-alcohols of low molecular weight, and have found that 1-aminopropan-2-ol, a structural isomer of 2-aminopropan-1-ol, and ninhydrin-reacting fragment are likewise indistinguishable on paper chromatograms irrigated with a number of different solvent systems. This observation is in complete agreement with that of Chargaff *et al.*[4] Furthermore, oxidation of 1-aminopropan-2-ol with acid potassium permanganate, followed by paper chromatography of the product, gives a yellow spot with the ninhydrin reagent, identical in every respect with that obtained from the ninhydrin-reacting fragment in a similar way. Thus, not only is the latter fragment chromatographically inseparable from 1-aminopropan-2-ol, but so also are their respective highly characteristic oxidation products.

We have previously stressed[3] the limitations attending the use of chromatographic methods for the identification of substances available only in microgram amounts. The evidence in this instance, however, appears to be more definite than is usually the case.

Dr. K. Folkers, during his recent visit to this country, was kind enough to inform us that independent studies by the Merck group had established the identity of the ninhydrin-reacting fragment with D-1-aminopropan-2-ol by the methods of classical organic chemistry.

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3. Cooley, Ellis and Petrow, *ibid.*, 1950, **2**, 128.
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