to the Senior Entomologist, Chemist and Agronomist of the West African Cacao Research Institute for help.

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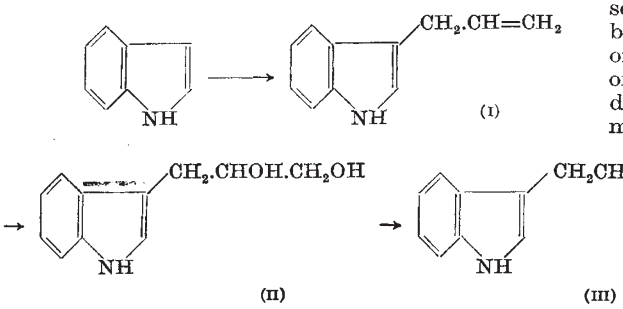
Synthesis and Biological Activity of β-Indolylacetaldehyde

β-Indolylacetaldehyde (III), the aldehyde corresponding to heteroauxin, has been reported to have been detected (for example, by enzymatic oxidation to an active acidic auxin) in the tissues of several plant species[1,2]. It has also been postulated



as an intermediate in the possible *in vivo* conversion of tryptophane into heteroauxin. Larsen[1] has described the preparation of a material containing about two per cent of β-indolylacetaldehyde by heating tryptophane with ninhydrin (or isatin) in aqueous solution; but so far, the pure compound has not been isolated or characterized by means of crystalline derivatives.

The desirability of having the pure aldehyde available for biological and chemical examination led us to embark upon the accompanying synthetical approach.

β-Allylindole (I) (picrate, m.p. 105·5–106°) was prepared from indolylmagnesium bromide and allyl bromide. Analogy with other reactions of indolyl Grignard reagents would indicate that the allyl group is attached at the β-position, and this was confirmed by infra-red measurements (to be reported separately). β-Allylindole reacted readily with osmium tetroxide to furnish the glycol (II), melting point 97·5–98°. This on cleavage with sodium periodate gave β-indolylacetaldehyde (III), boiling point 120° (bath temp., short-path still) at 10^{-5} mm., n_D^{18} 1·6178 (found: C, 75·15; H, 5·3. $C_{10}H_9ON$ requires C, 75·4; H, 5·7 per cent). Light absorption in ethanol, maxima at 2170 A., 2800 A. and 2890 A. (ε = 32,600, 6,020 and 4,980 respectively). Infra-red spectrum: N—H stretching frequency at 3,430 cm.$^{-1}$, and C = O stretching frequency at 1,705 cm.$^{-1}$. The aldehyde was further characterized as the semicarbazone (melting point 142–155°), 2 : 4-dinitrophenylhydrazone (melting point 196–202°), and the dimedone derivative (melting point 148–152°), the three derivatives giving correct analytical data (melting points were determined on a Kofler block).

From previously reported work employing crude β-indolylacetaldehyde, it is uncertain whether this compound functions as a plant growth-hormone. The pure aldehyde has now been tested for biological activity in the *Avena* straight-growth test[3] in the Department of Botany of this University. We are indebted to Dr. J. A. Bentley and Mr. S. Housley for the following preliminary report on its activity.

(*a*) A 1 mgm./l. solution of the aldehyde shows an activity equivalent to that of a 0·1 mgm./l. solution of β-indolylacetic acid. With a 10 mgm./l. solution, the activity is still only equivalent to that of a 0·1–0·2 mgm./l. solution of heteroauxin.

(*b*) During the biological assay, an acidic substance (probably β-indolylacetic acid) is produced. For example, using a 1 mgm./l. solution of the aldehyde, the concentration of the acidic product determined by subsequent bio-assay is equivalent to a 0·1–0·2 mgm./l. solution of heteroauxin.

(*c*) However, with control solutions of the aldehyde exposed to the same conditions as the test solutions but without the presence of coleoptile sections, an acidic substance is produced which by bio-assay is equivalent to a solution of heteroauxin of approximately only 1 per cent of the concentration of the aldehyde in the solution. Thus, *in vitro* change does not account for all the production of acidic material in the presence of coleoptiles.

Since the activity of the acidic substance produced in the presence of coleoptiles is equal to, or greater than, the activity of a solution of β-indolylacetaldehyde at the same concentration, it is concluded that the aldehyde itself is either inactive or inhibitory.

Further details of the synthetical work will be published elsewhere; a more detailed account of the biological results will be published separately in the botanical literature.

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[1] Larsen, P., "Ann. Rev. Plant Physiology", 2, 176 (1951); this article summarizes previous work in this field.
[2] Gordon, S. A., and Nieva, F. S., *Arch. Biochem.*, 20, 356, 367 (1949).
[3] Bentley, J. A., *J. Exp. Bot.*, 1, 201 (1950).

A New Colour Reaction of Streptomycin

The reaction between streptomycin and diacetyl seems not to have been reported in the literature. When mixed with diacetyl in aqueous alkaline solution, this antibiotic produces a pink colour by virtue of its guanidine groupings, the reaction being of the type first described by Voges and Proskauer[1], and investigated by several other workers[2].

Like the original Voges–Proskauer reaction, the colour production with streptomycin could be greatly intensified by the further addition of α-naphthol following the procedure of Barritt[3]. Such a modification increased the sensitivity only; other properties of the two reactions were essentially the same, namely: (1) colour was slow to develop, and faded after reaching a maximum density; (2) oxygen was necessary both for colour development and for the fading process, since sodium sulphite or ascorbic acid could be used to halt the reaction at any desired stage; (3) strong absorption was found at the shortest wave-lengths of visible light, with a characteristic