The corresponding values of $V'$ vary between 3 ml./gm. for $M = 14{,}000$ and 30 for $M = 3{\cdot}3 \times 10^6$, indicating considerable degrees of solvation. Kuhn and Kuhn[6] have shown that the effect of branching of a flexible chain is to reduce the volume which it occupies in solution compared with that occupied by an unbranched chain of the same total length (that is, the same molecular weight). The volumes deduced above lie between 0·17 and 0·09 of the volumes predicted by the theory of Kuhn and Kuhn for unbranched flexible chains of glucose units, and this agrees with the chemical evidence[7] in suggesting a high degree of branching.

We conclude that the data available indicate that dextran particles in solution are highly solvated and not very asymmetric, and that this view is consistent with what is known of their chemical structure.

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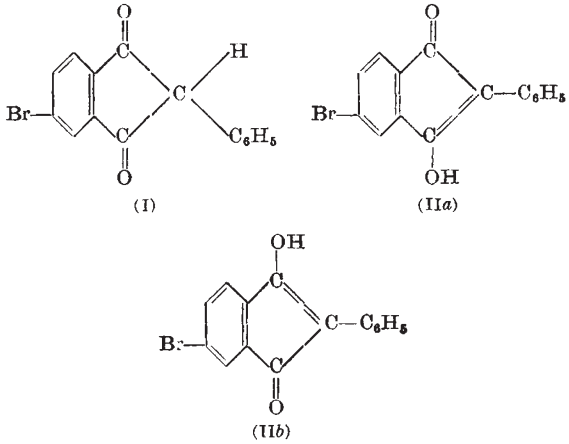
## Thermochromism and Keto-Enol Tautomerism of Solutions of 1 : 3-Diketo-2-phenyl-5-bromoindan

In connexion with the growing interest in the phenomenon of thermochromism[1], we should like to describe some experiments with 1 : 3-diketo-2-phenyl-5-bromoindan (I). In contrast to 1 : 3-diketo-2-phenylindan, which exists only in a colourless, solid form, (I) exists in a deep violet, solid form (II*a* or II*b*) and an almost colourless, solid, ketonic form (I). Koelsch[2], who discovered these forms, stated that by crystallization from non-polar solvents the white modification is obtained, and from polar solvents the violet-black modification is formed; he mentioned only acetic acid and benzene as solvents. According to our observations, dilute solutions of the violet-black form in ethyl benzoate are orange at $-10°$, whereas at the boiling point of the solutions they are light-yellowish. The process is reversible and may be explained by assuming that, at high temperatures, the keto form is predominant, whereas in the cold the enol form (II*a* or II*b*) is present in greater concentration. This opens a route for the investigation of the position of the equilibrium between the keto and the enol forms in relation to temperature by the investigation of the visible spectrum.

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## Anatomical and Physiological Evidence of Anastomosis of the Hepatic Artery and Hepatic Vein within the Mammalian Liver

That the hepatic artery sends direct branches to the hepatic vein in the livers of Amphibia has been established[1]. Several workers have reported translobular branches in mammalian livers; but the evidence is frequently indirect. Chronszczewsky[2], Braus[3] and Loeffler claim to have seen such a vessel; Elias[4] is a protagonist of the view of Chronszczewsky, whose work he has repeated; he also reports that the arterial blood gains the centre of the lobule via thin-walled capillaries which run in close apposition to the parenchyma. Seneviratne[5], using a trans-illumination technique, also supports the existence of translobular arterial vessels. Owing to technical difficulties these arterial vessels have not been shown convincingly, and their presence is not yet generally accepted.

The vessels can, however, be demonstrated by the following technique. Immediately after death the liver is washed with a slightly alkaline solution[6]. When the organ is free from blood, the portal venous system is blocked by perfusion of the portal vein with a suspension of kieselguhr in saline. 'Hycar' latex is then put into the arterial system at a pressure of about 200 mm. mercury and, afterwards, coloured neoprene is run into the hepatic vein in a retrograde direction at a pressure of 30 mm. mercury. The organ is then fixed in acid formalin, and a cast of the vascular system obtained by digestion with commercial hydrochloric acid.

The completeness of the injection varies somewhat from liver to liver. In successful preparations the arterial and hepatic venous trees are well injected, and only isolated segments of the portal venous tree appear; the sinusoids are frequently not filled, except for localized areas. On occasion, the hepatic tree has been almost fully filled from the arterial side without injection of sinusoids. This filling is achieved by means of direct arterio-venous anastomoses, one of which is shown in the accompanying photograph.