In orthogonally planned experiments with potassium chloride and barium chloride solutions in cells $0\cdot695$, $0\cdot975$ and $1\cdot396$ cm. high, with $T = 25^\circ$ C. and $T + \Delta T = 35^\circ$ C., diffusion constants required to satisfy the de Groot equations were substantially independent of cell height and concentration of solution, and in agreement with literature values for solutions ranging in mole fraction from $0\cdot074$ to $0\cdot018$ for potassium chloride, and from $0\cdot019$ to $0\cdot002$ for barium chloride.

The Soret coefficients for the above solutions are small, about $0\cdot1$–$0\cdot2$ per cent per degree, and the measurements provided a test of the sensitivity of the experimental method.

It is hoped to publish the work in detail and to extend it to other systems.

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Cellular Permeability of Yeast to Metallic Ions

THE apparatus devised by Dr. G. Protti for the kinetic study of cellular metabolism with radioactive isotopes[1] lends itself to permeability studies of yeast. We are using it to study their permeability to different metals.

The metal content of yeast is assumed constant, and the whole of the radioactive isotope is introduced at the beginning of the experiment. Then the rate of disappearance of radioactive metal ions is described by the differential equation :

$$\frac{V}{L}\frac{dx}{dt} = - v\frac{x}{Lb/V} v\frac{(x_0 - x)\,V/L}{a},$$

where a is gm. metal per gm. yeast ; Lb/V is gm. metal ion per ml. solution ; L is gm. yeast ; V is ml. solution ; x and x_0 are gm. radioactive metal ion per ml. solution at end and beginning of experiment respectively ; t is time in hours ; v is permeability measured in $\dfrac{\text{gm. metal}}{\text{gm. yeast hr.}}$.

Integrating this equation gives :

$$\frac{x}{x_0} = \frac{a.\exp\left(- v\dfrac{a+b}{ab}t\right)}{a+b} \cdot b \,;$$

and then :

$$v = - \frac{1}{t}\frac{a.b}{a+b}\ln\left[\frac{x}{x_0} - \frac{b}{a}\left(1 - \frac{x}{x_0}\right)\right].$$

The validity of this equation has been confirmed by experiments using *Saccharomyces cerevisiæ* and copper-64 obtained from the Atomic Energy Research Establishment, Harwell ; in these experiments, $v = 7\cdot2 \times 10^{-6}$.

Experiments with other metals are still in progress.

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A Novel Synthesis for Aroylacrylic Acids

THIS preliminary investigation was undertaken in an effort to apply the Doebner condensation to the synthesis of aroylacrylic acids according to the following equation :

$$ArCOCHO + CH_2(COOH)_2 \xrightarrow{\text{pyridine}} ArCOCH{=}CH{-}COOH + CO_2 + H_2O.$$
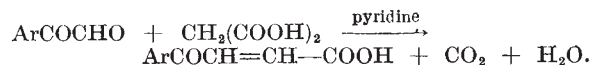
The compound chosen for study was 2-naphthylglyoxal, because the properties of the resulting *beta*-2-naphthoylacrylic acid would help clear up certain doubts about its structure at the time this work was begun (however, see ref. 1).

2-Naphthylglyoxal was obtained easily in 75 per cent yield by oxidation with selenium dioxide of methyl 2-naphthyl ketone[2,3]. 2-Naphthylglyoxal monohydrate (15 gm.), malonic acid ($7\cdot5$ gm.) and pyridine (15 ml.) were stirred for 22 hr. at room temperature. Carbon dioxide was evolved and a solid mass remained. The material was taken up in 5 per cent sodium carbonate solution and acidified to give a gummy semi-solid which hardened on standing several hours. Several recrystallizations from dilute alcohol (decolorizing carbon) gave a 12 per cent yield of bright yellow crystals of *beta*-(2-naphthoyl)-acrylic acid, melting point 164–166° [1] (calc. for $C_{14}H_{10}O_3$: C, $74\cdot32$; H, $4\cdot46$; neut. equiv., $226\cdot2$; found : C, $74\cdot42$, H, $4\cdot56$; neut. equiv., $227\cdot1$). The compound gave a rapid Baeyer's test and positive tests with phenylhydrazine and 2,4-dinitrophenylhydrazine. Tollen's reagent and Schiff's reagents were negative. It was quantitatively hydrogenated at 3 atmospheres pressure over a palladium-on-carbon catalyst to the known *beta*-2-naphthoylpropionic acid, melting point 170–172°. The acid is probably *trans*, since refluxing it with a crystal of iodine in either benzene or chloroform effected no change in the melting point.

Work to be reported elsewhere will show that this novel condensation is adaptable to the synthesis of negatively substituted aroylacrylic acids, such as *beta* - (4 - nitrobenzoyl)acrylic acid—which are not obtainable through the conventional Friedel and Crafts reaction—and with considerable increase in yield over that reported here.

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Action of Alkaline Hypochlorite on 3 : 5 : 6-Trimethyl-*d*-gluconamide

THE action of alkaline hypochlorite upon fully methylated hexonic and pentonic acid amides, using the Weerman procedure[1], results in the formation of cyclic urethanes[2]. Haworth, Peat and Whetstone[3], using this reagent, claimed the direct conversion of 3 : 5 : 6-trimethyl-*d*-gluconamide (which possesses a free α-hydroxyl group) to a 2 : 4 : 5-trimethyl arab-