

They also referred to unpublished evidence, obtained by Chaplin, for the discontinuous adsorption of phenol from aqueous solutions on an active technical charcoal. This statement apparently refers to an investigation the details of which have now been published.<sup>2</sup> Of the three isothermals obtained, Chaplin prefers to place reliance upon the third one, the other two being inaccurate for the reasons discussed by the author himself. Chaplin has drawn an isothermal curve through the experimental points which exhibits marked discontinuities. It appears, however, that the curve has been drawn in an arbitrary manner, and a smooth adsorption isotherm can be obtained within the experimental error, only one point being markedly off the curve.

If the existence of discontinuities could be clearly substantiated, then this must lead to a reconsideration of current adsorption theories. With the hope of throwing some light on the subject, it was decided to

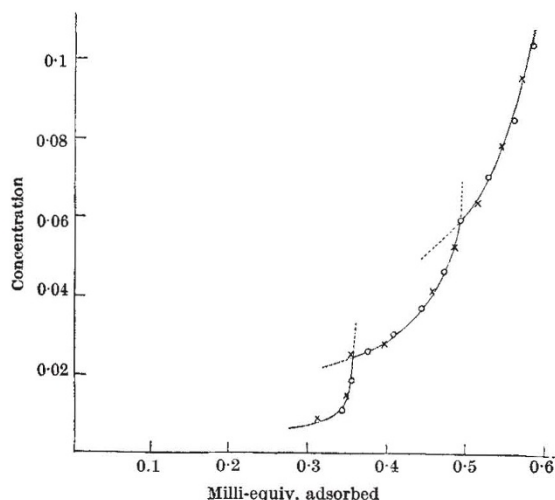


FIG. 1.—Curve showing the quantity of phenol adsorbed (milli-equivalents) from 25 c.c. solution per gm. of charcoal as a function of the concentration (milli-equivalents in 25 c.c.).

repeat Chaplin's work, employing another and probably more accurate method of analysis. The adsorbent used was an oxygen (atmospheric) activated ash-free sugar charcoal which has been employed previously,<sup>3</sup> and the concentrations of the phenolic solutions were determined with a Zeiss interferometer; the phenol used had been purified by repeated fractional distillation. A very unusual adsorption isotherm (25°) was obtained (Fig. 1) with two series of measurements. No discontinuities of the type postulated by Allmand and his co-workers have been found, but the isotherm is composed of three distinct curves, each of which appears to extrapolate back to the origin.

Several interesting possibilities present themselves, but it is desirable to investigate the phenomena more intensively before a detailed discussion is entered upon. It is, however, worth pointing out that each of the curves, when treated independently, conforms to the adsorption theory of Langmuir.

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<sup>1</sup> *Trans. Far. Soc.*, **28**, 218; 1932.  
<sup>2</sup> *J. Phys. Chem.*, **36**, 909; 1932.  
<sup>3</sup> *J. Chem. Soc.*, 613; 1932.

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### Effect of Carbon Monoxide on the Biological Reduction of Nitrate

THE reduction of nitrate is accomplished by cells of very diverse types—plant, animal, and bacterial. A thermolabile catalyst controls the activation of nitrate, though cases are known where apparently nitrate may be reduced by biological means without the intervention of a specific catalyst.<sup>1</sup> The distribution of the nitrate oxidase, as the catalyst may be conveniently termed, seems to be very haphazard; it occurs in the livers of most animals, but nitrate reduction in muscle is confined to the rat and guinea-pig. Among the bacteria, it is absent from obligate anaerobes and aerobes, but it occurs in most facultative anaerobes. With these organisms nitrate serves as an oxidising source and will enable anaerobic growth to occur in its presence.<sup>2</sup> The nitrate oxidase is present in *B. coli*, the ability of which to reduce nitrate to nitrite has been made a test of its presence in biological fluids. The activity of the enzyme is greatly inhibited by traces of hydrogen cyanide,<sup>3</sup> but if a suspension of *B. coli* which has been exposed to quite a high concentration of hydrogen cyanide is well washed with saline the organism regains its ability to activate nitrate.<sup>4</sup> The effect of cyanide on nitrate oxidase is thus reversible.

Preliminary experiments, carried out recently in this laboratory, now indicate that carbon monoxide has a small but definite inhibitory action on the reduction of nitrate by *B. coli*, the inhibition apparently being greater the smaller the quantity of nitrate present.

Nitrate reduction by *B. coli* in presence of a suitable donor is not only inhibited by carbon monoxide but also by oxygen, the effect with oxygen being far greater than with carbon monoxide. From the facts available so far, it would seem that nitrate, carbon monoxide, and oxygen all compete for the nitrate oxidase, and the inference would be that the enzyme belongs to the iron-containing class of molecule which has been described as responsible for the activity of peroxidase, catalase, and the indophenol oxidase. Further investigation is necessary to decide whether this is the case.

There is some evidence that the chlorate oxidase of *B. coli* is inhibited also by oxygen and carbon monoxide.

Details of this work will be published in due course.  
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<sup>1</sup> Bernheim and Dixon, *Biochem. J.*, **22**, 125; 1928.  
<sup>2</sup> Quastel, Stephenson, and Whetham, *Biochem. J.*, **19**, 304; 1925.  
<sup>3</sup> Löffler and Rügler, *Biochem. Z.*, **173**, 449; 1926.  
<sup>4</sup> Quastel and Wooldridge, *Biochem. J.*, **21**, 1234; 1927.

### Zoological Nomenclature

IN accordance with prescribed routine, the undersigned invites the attention of zoologists to the fact that application has been made to the International Commission on Zoological Nomenclature to suspend the Rules and to place in the Official List of generic names:

*Lepidocyclus* Gümbel, 1868, type (1898) *Nummulites mantelli*; objective synonym *Cyclosiphon* Ehrenberg, 1856, type *N. mantelli*; *Lytoceras* Suess, 1865, genotype *Ammonites fimbriatus* Sowerby; and *Ophiceras* Griesbach, 1880, genotype *O. tibeticum* Griesbach.

These cases will be held open until about July 1, 1933, to enable zoologists to submit to the Commission their opinions, for or against the proposition.

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