workers to-day would agree that both postulates are necessary to account for failures of immediate recall, it has proved difficult to examine either in isolation. In the course of a study relevant to the memory requirements for using telephone dials, an experiment was carried out which would seem to provide unambiguous support for the decay theory of recall.

Thirty subjects listened to 8-digit numbers which had been recorded on tape at rates either of 30 or 90 digits per minute. Immediately at the end of each number, a timing device was started which clicked loudly at one of two rates, again either 30 or 90 per minute. Subjects wrote down the 8-digit number they had just heard, one digit at a time, in step with the timer. In the condition with both presentation and recall at the slow rate, for any given digit in the series, the interval between presentation and recall was three times longer than when both rates were fast.

The proportion of numbers correctly recalled was significantly greater with the shorter delay (0·41, 0·32). Furthermore, without exception, individual digits in the same serial position were correctly recalled more frequently at the fast rate. Trebling the interval between presentation and recall approximately doubled the number of digits forgotten.

Since it seems that the longer one is restrained from recalling, the greater is the likelihood of forgetting, it might be expected that recall at a free rate would be superior to recall at any constrained rate. The above method, without the timing device, was used to test this. The proportions of wrong numbers at paced recall rates of 30 or 90 digits per minute and under a condition of free recall were, respectively, 0·65, 0·59 and 0·38. It is difficult to explain these results other than in terms of decay theory.

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Discovery of Ammonoids of the Upper Devonian *Wocklumeria* Zone in North Cornwall

RECENTLY, Dr. R. Goldring[1] has been able to make a direct correlation of the lower part of the Pilton Beds of North Devon with the *Wocklumeria* Zone of the Sauerland, Germany. This correlation is based on the trilobites which occur both with the brachiopod faunas of the Pilton Beds and the ammonoid faunas of the Sauerland. Thus the German faunal horizon was precisely identified in England for the first time.

Evidence for the presence of the *Wocklumeria* Zone south of the Culm has hitherto been lacking: it has now been identified in the Launceston district.

On July 18, 1956, one of us (M. R. H.), searching the collections in the Penzance Museum, discovered a single specimen of *Wocklumeria sphaeroides* (R. Richter) which is identical with those figured from the upper *Wocklumeria* Stufe of Germany by Schindewolf[2] (pl. 1, Fig. 14, pl. 2, Fig. 1). The specimen (Collection No. 233) is labelled "Yeo(or Yea)lmbridge". This is very probably the locality given as Yeolmbridge, two miles north of Launceston, which was well known to the early collectors. This specimen was exhibited at the annual reunion of the Geologists' Association in London on November 3, 1956.

In late July 1956, the second writer (E. B. S.), working independently, discovered a locality in the Launceston area which has yielded a well-preserved ammonoid fauna including the genera *Clymenia*, *Kalloclymenia*, *Kosmoclymenia*, *Wocklumeria*, *Epiwocklumeria*, *Parawocklumeria*, *Sporadoceras* and *Imitoceras*. This is a typical *Wocklumeria* Zone fauna. A full description of the locality and its fossils is being prepared (by E. B. S.).

These discoveries mean that the supposed hiatus in the Upper Devonian to Lower Carboniferous succession of Cornwall has been greatly reduced, and that representatives of all the major German Upper Devonian ammonoid zones have been now identified in England.

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[2] Schindewolf, O. H., *Abh. preuss. geol. Landesanst.*, N.H., **178**, 1 (1937).

Graphical Methods in Enzyme Chemistry

IN 1932, Dr. Kurt Stern published a German translation of my book "Enzymes"[1], with numerous additions to the English text. On pp. 119–120, I described some graphical methods, stating that they were due to my friend Dr. Barnett Woolf. Michaelis's equation may be written $v = \frac{Vx}{x + K}$, where x is the substrate concentration at any moment, v the velocity with which the substrate is being destroyed, V the velocity when the enzyme is saturated, and K the Michaelis constant. Woolf pointed out that linear graphs are obtained when v is plotted against vx^{-1}, v^{-1} against x^{-1}, or $v^{-1}x$ against x, the first plot being most convenient unless inhibition is being studied. But competitive inhibition gives a pencil of lines through the point $(0,V^{-1})$, while non-competitive inhibition gives a pencil through the point $(-K^{-1},0)$, when v^{-1} is plotted against x^{-1}.

These methods were afterwards rediscovered by others, the first of these rediscoveries being by Lineweaver and Burk[2]. Dr. Woolf was undergoing a serious illness as the result of an accident, and never published the results which he had shown me in draft form. Recently, Hofstee[3] has credited me with the invention of these methods without mentioning Woolf's name. Squabbles as to priority are undignified; but if anyone is to be credited with these methods, the credit belongs entirely to Woolf, and not to myself, unless indeed he and I had overlooked still earlier work.

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[3] Hofstee, B. H. J., *Enzymologia*, **17**, 273 (1956).