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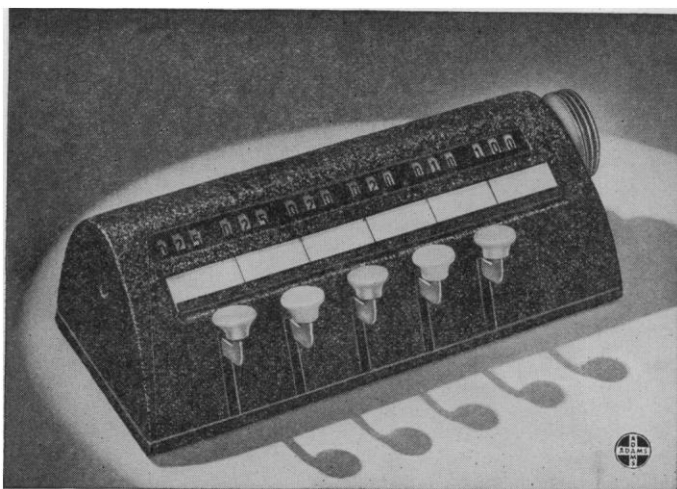
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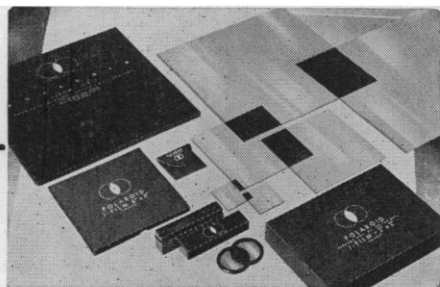
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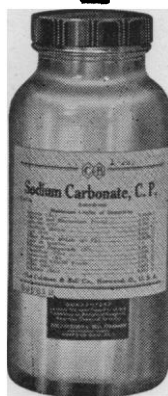


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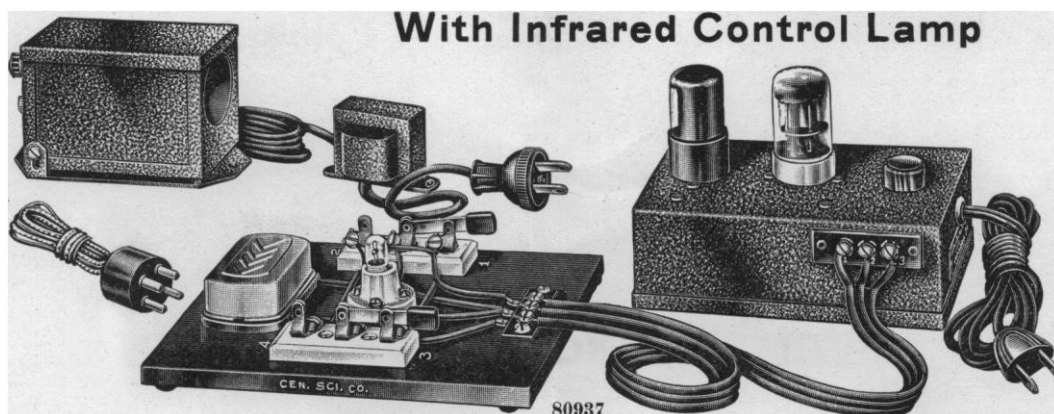
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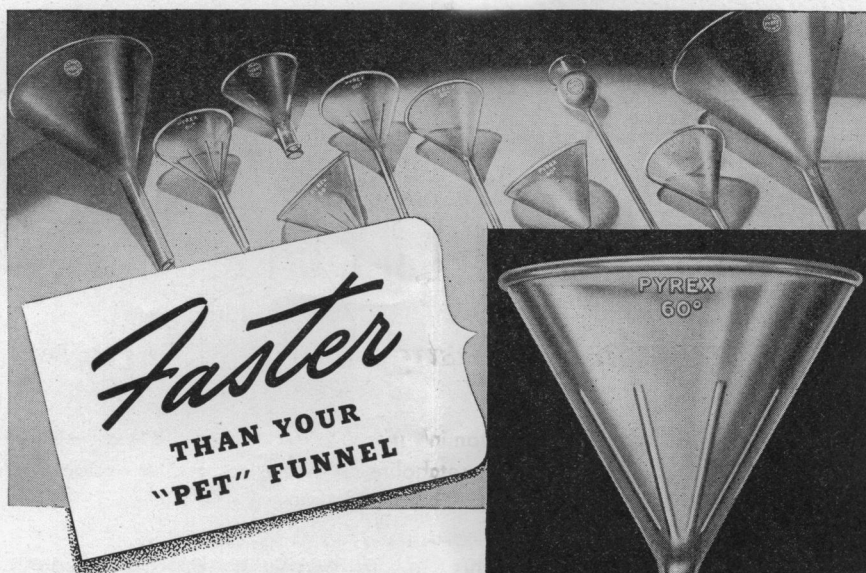
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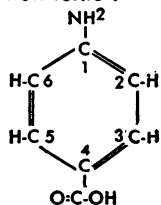


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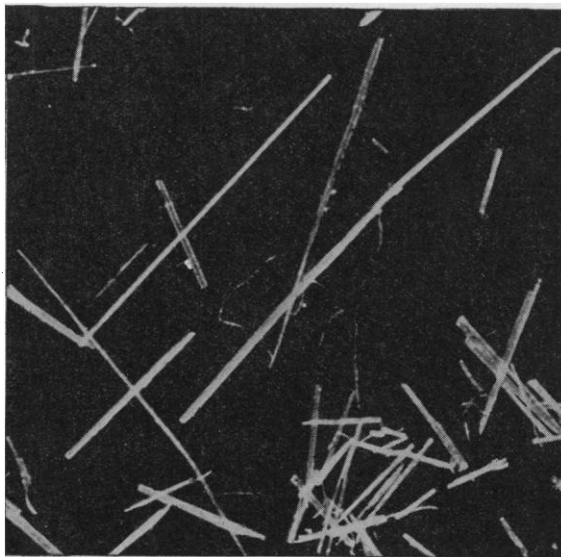
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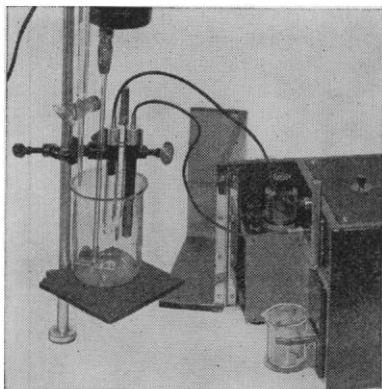
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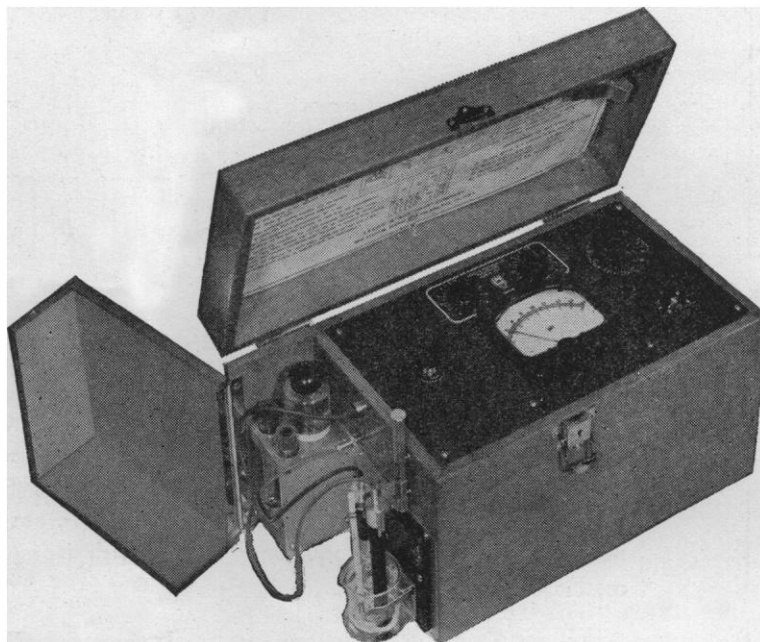
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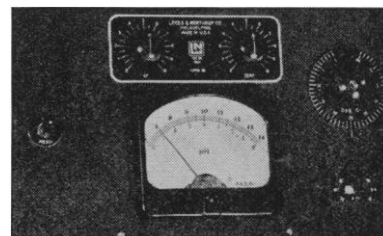
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PROCESSES OF ORGANIC EVOLUTION¹

By Professor R. RUGGLES GATES

UNIVERSITY OF LONDON, KING'S COLLEGE

OMITTING the Greek philosophers and the adumbrations of the early naturalists, the first thorough-going theory of evolution may be said to be that of Lamarck. In his time, however, even the elements of physical and chemical science were in a rudimentary state, so that the nature of organic structure and functioning was but little understood. His theory of the direct impress of adaptive modifications on the organism and their transmission by inheritance to future generations failed to convince the world at large of the fact of evolution and has since failed of acceptance by critical students of evolutionary processes. Darwin partly accepted this principle of the inheritance of acquired characters, which was only natural, considering the very sketchy and inadequate knowledge of the

nature of reproductive processes in plants and animals in the middle of the nineteenth century, when the "Origin of Species" was written. It may even yet find support in some subtler serological form.

Darwin, however, stressed his principle of natural selection as the main force causing evolutionary adaptation. This theory was derived in turn from an extension of Malthus's law of human populations, and still stands as an almost universally accepted process in the modification and replacement of species. But evolutionists still differ widely in the emphasis they would lay on natural selection in comparison with other evolutionary processes. Darwin relied upon the selection of variations of all kinds occurring in large numbers in the species, but in his time very little was known either of the nature of these variations or the manner of their inheritance. Had Mendel's paper on

¹ Substance of a lecture at the University of California, Berkeley, November 27, 1940.

where he can easily reach the switches and controls (all located on the front panel of the rack) and then can look through the large eye pieces at the magnified image of the specimen under observation. At the twist of a knob, he can adjust the brightness of the image, bring it into sharp focus or vary the magnification over a wide range. He can turn another knob and adjust the position of the specimen until the most interesting portion of the field comes into view. This latter control, by the way, affords an extremely fine vernier motion by means of which the image position can be set to within a sixteenth of an inch even when the image magnification is 30,000 times. This means that the actual position of the specimen can be set to within two one-millionths of an inch!

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¹ Dam *et al.*, *Helv. Chim. Acta*, 22: 310, 1939.

gation of vitamin K concentrates and in studies relating to its distribution, etc. Unfortunately, it is not suitable for a quantitative test because of the changing color.

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² Fernholz, Ansbacher and Moore, *Jour. Am. Chem. Soc.*, 61: 1613, 1939.

BOOKS RECEIVED

- Annual Report of the President of Stanford University for the Forty-ninth Academic Year ending August 31, 1940.* Pp. ix + 569. The University.
- British Museum (Natural History). *Ruwenzori Expedition, 1934-5. Vol. II, No. 4. Muscidae: B-Coenosuinae.* F. I. VAN EMDEN. Pp. 91-255. 82 figures. 10/.
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- DAUGHERTY, LYMAN H. *The Upper Triassic Flora of Arizona.* Pp. iii + 108. 34 plates. Publication No. 526 of The Carnegie Institution of Washington. \$1.25.
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