four each in the Menispermaceae, Anacardiaceae, Icacinaceae, Lythraceae and Cornaceae; five in the Rutaceae and 5 of unknown relationship; making a total of 67.

In addition to the 234 identified species there are 80 additional of doubtful relationship or unnamed. Only one wood is named, and the description of the abundant woods in the clays is reserved for later publication.

Bowerbank's genus Petrophiloides (Juglandaceae) is found to belong to the same genus as the eastern Asiatic tree for which Siebold and Zuccarini proposed the term Platycarya, and as the evidence is conclusive and the former term is 3 years older it replaces the latter. Another of Bowerbank's species, *Cupressites sulcatus,* is found to belong to the genus Toona (Meliaceae), although living forms were not discovered until six years after the fossil species was described.

The most prominent family is the Lauraceae with 31 species; next the Icacinaceae with 19, the Euphorbiaceae with 15, the palms with 14, Anacardiaceae and Anonaceae with 13 each, Sapindaceae with 11, Magnoliaceae and Vitaceae with 10 each, Rutaceae and Cornaceae with 9 each, Menispermaceae with 7, and no other dicotyledonous family with more than 5. Strangely enough, there is but a single species belonging to the Leguminous alliance. This may be contrasted with the 19 genera and 87 species of Leguminosae in the contemporaneous American Wilcox flora. The London clay flora contains 8 conifers, which seem to me to be somewhat discordant with the strictly tropical character which this flora is said to indicate.

The authors conclude that the London Clay flora has its major affinities with the floras of the present Indo-Malayan region, and was mainly a tropical rain forest, living at its northernmost range, under conditions of great precipitation suitably distributed, rather uniform temperatures and frostless winters, and that it reached England along the shores of Tethys.

Most of these conclusions can be relied upon as being as close approximations to the truth as it is possible to obtain with the evidence available, although the reviewer is inclined not to go the whole way in regard to the lowland tropical character. There are a number of things unaccountably absent which should be present in such an assemblage, and it seems to illustrate the difficulty, which has been often stressed, of visualizing a tropical rain forest from the literature or even from counselors who have actual first-hand knowledge of their features and permutations.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A DEVICE FOR AUTOMATICALLY PLOTTING CHANGES IN RATE OF AN INTERRUPTED SIGNAL

IN the course of a study in which the rate of heart beat and respiratory movements were compared (Gesell and Nyboer, 1929) it was desirable to record automatically changes in rhythm as a continuous curve during the progress of an experiment. Such a method was developed and demonstrated at the 1930 meetings of the Federation of Biological Sciences. Inasmuch as the device has been helpful in saving tedious measurements and computations a short description is now published.[1]

The contour of the curve is indicated by a series of short vertical marks described on smoked paper by

[1] A somewhat similar device has been described by Fleisch, *Zeitschrift für die gesammte experimentelle Medizin,* 72: 384, 1930.

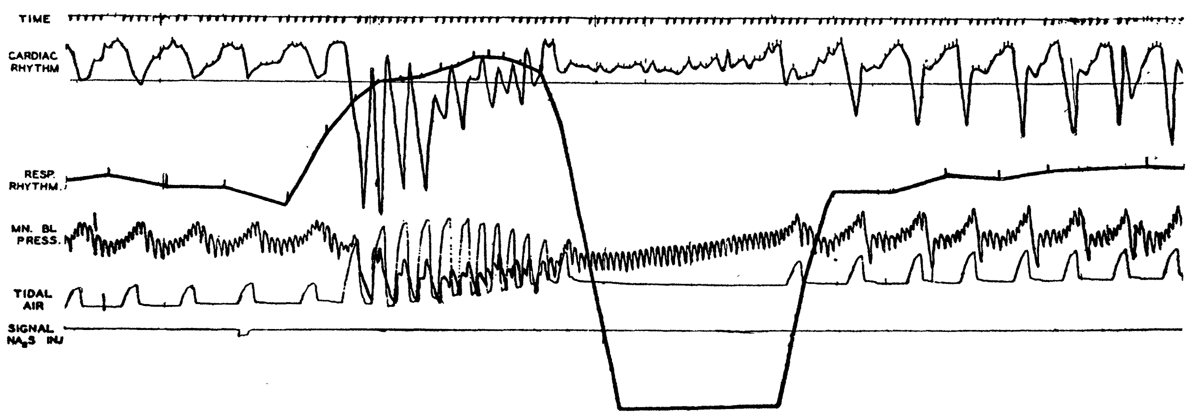

FIG. 1. Record of spontaneous changes in cardiac and respiratory rhythm and changes resulting from an intravenous injection of sodium sulphide. The vertical dashes indicating the contour of the rhythm curves have been connected by a continuous line.

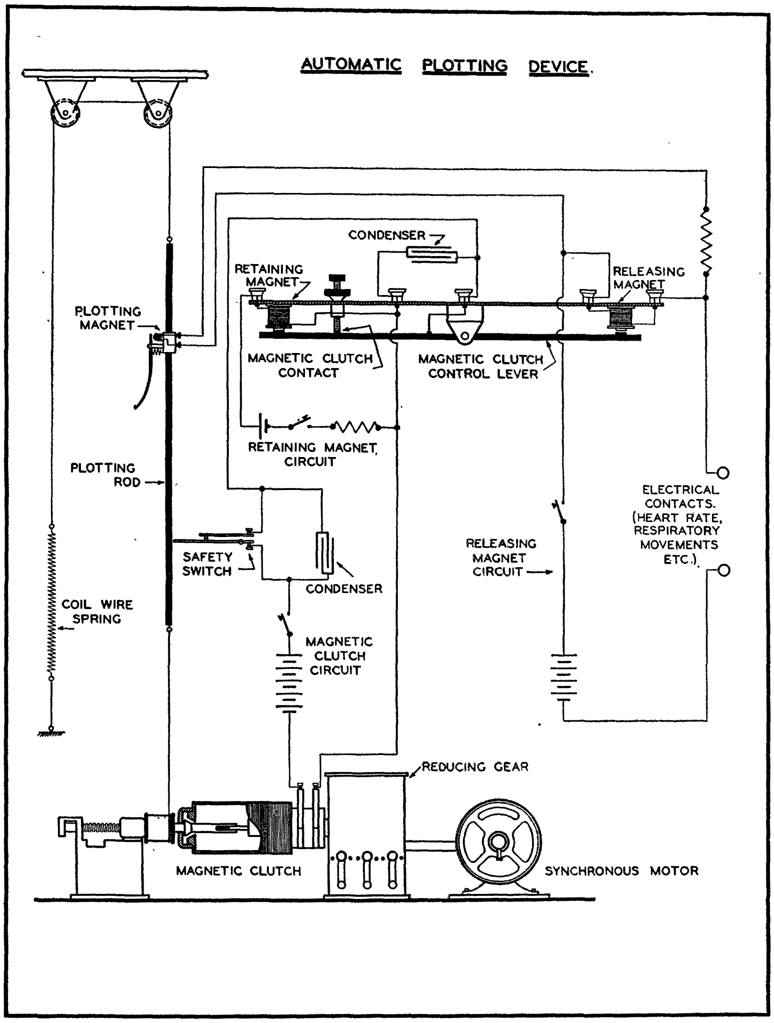

FIG. 2. Schema showing the working principles of the automatic plotting device.

a plotting magnet (see Figs. 1 and 2) momentarily activated as it travels repeatedly downwards on a vertically moving plotting rod mounted in close proximity to the recording drum. Each excursion of the plotting magnet begins at the same starting point, descending at a uniform rate until interrupted by the signal. At that moment the plotting magnet is activated to mark the lowest point of the excursion and is then suddenly elevated to the starting point when a new excursion is initiated. Just as the plotting magnet reaches its highest point on its upward excursion the magnetic clutch contact is mechanically closed by an upward push of the left arm of the magnetic clutch control lever which also serves to check the upward excursion of the plotting rod. The contact is maintained by the retaining magnet, which is excited by a steady flow of current. The magnetic clutch solenoid is now activated; the magnetic clutch is engaged; the magnetic clutch pulley revolves, and the plotting rod is drawn downward against the counter pull of a coil spring until the next signal arrives. At that moment the releasing magnet is temporarily activated; the magnetic clutch contact is broken and the left arm of the control lever is drawn out of the field of the retaining magnet. The magnetic clutch is now disengaged; the plotting rod is suddenly elevated and the pulley unwound by the tension of the coil spring. Reaching the starting point, the magnetic clutch contact is closed again and the cycle repeats itself.

To permit recording of interrupted frequencies of great range, the gear box is provided with gear shifts making 12 available velocities of the downward excursion of the plotting rod ranging from 0.36 cms to 16 cms per second.

Methods of obtaining effective signals for recording cardiac and respiratory rhythm have been described by Dr. Nyboer.[2]

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[2] "Comparison of Changes in Cardiac and Respiratory Rhythms Effected in the Dog by Changes in Physiological Conditions," Nyboer, *Amer. Jour. Physiol.*, 106: 204, 1933.