

LETTER TO THE EDITOR

A new technique for the measurement of age by radiocarbon

The standard procedure for the routine ^{14}C age measurements makes use of Libby's screen wall counter (for recent reviews see ref 1 and 2). This technique has some drawbacks, however. Firstly the preparation of pure carbon from the archaeological material is laborious. Secondly the sample has to be brought into the Geiger counter; this implies that the counter has to be disassembled for each sample. Finally the efficiency is poor (about 5 per cent).

We have tried with success to use CO_2 as the filling gas of a proportional counter. A Geiger counter proved to be less suited for the present purpose. For the proportional counter carbon dioxide turned out to be a good filling gas, but contamination by electro-negative gases has to be avoided. This does not offer serious problems, however. The amount of material needed is only about one tenth of the amount needed in a screen wall counter because of the better efficiency (100 percent for the counting volume and about 50 per cent for the whole volume of the counter). The plateau (counting rate versus voltage) had a length of 2000 volt and a slope of only about 1 percent per 100 volt.

The background of our counter (length 16 cm, diameter 5 cm) was the same as the background of the screen wall counter (4/min). The effect due to modern CO_2 in our counter was 4/min whereas the same effect in a screen wall counter is about 7/min. Up to now, however, we only used a pressure of 2 atm but more gas can be brought into the counter without essential difficulties. In this way older samples can be studied or the same accuracy can be obtained in a shorter time.

A complete description of the apparatus for routine measurements will be published in the near future.

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