## South and East African Stone Age Typology

Two separate communications[1,2] this year on the archæology of South Africa bear indirectly on East African problems now being investigated in Uganda by this expedition.

In the first, Prof. Dreyer directs attention to the similarity that exists, in his opinion, between certain human skulls found in association with implements of Early Mossel Bay type, and those of Kanjera, Kenya. From the fact that these relics came from the base of a superficial black layer, he draws the conclusion that they are of post-Pleistocene age. Below the black layer is a red sand deposit which contains Late Stellenbosch implements (Acheulean cum Levalloisian) with which, in a shelter, Prof. Dreyer has also had the good fortune to find human remains. He makes the dubious assumption that if we regard the Middle Stellenbosch as being the culture of the same people "we at last come to the [man] more or less contemporaneous with Leakey's Kanjera man".

The uncertainty of the association of the Kanjera fragments[3] with the Chellean tools found in the same area precludes discussion of the relative ages of these two sets of human remains; but as Prof. Dreyer suggests that owing to the thickness of the beds at Kanjera, Leakey may have over-estimated their age, it should be noted that the East African Chellean forms part of a very long evolutionary sequence and that no late dating will satisfy the period of time required. Moreover, Middle Stellenbosch is not the same stage as the Chellean found at Kanjera, but several stages later. Actually, it is more akin to the East African Early Acheulean. In Uganda this stage marks the beginning of a large-core technique for the manufacture of *coups de poing* and cleavers, and many of the finished implements have inclined platforms very like the Clactonian, and simply due to the same sort of core technique for the detachment of flakes. Evidence is available in Uganda which suggests the presence here of a large flake culture, separate from, but contemporary with, the Chellean.

In the second communication, Prof. van Riet Lowe again directs attention to the use of a prepared core technique for the production of large flakes, afterwards trimmed into handaxes and cleavers of Upper Stellenbosch age, and deals, let us hope, the final blow to the Victoria West Mystery.

In Uganda, geological proof of the date of the Early Acheulean is more or less settled, and shows that the industry had begun when the Intrapluvial in Pluvial II (Wayland) started, and is the same as the stage near the top of the red Bed III, at Oldoway, which similarly marks the climatic break. This oscillation may be equated with that between the Kamasian and Gamblian pluvials—the evidence being based on the succession of types following the Early Acheulean in Kenya, at Oldoway and in Uganda.

Owing to the fact that the Upper Stellenbosch is followed by Lower Fauresmith (Late Acheulean cum Old Levalloisian), whereas in East Africa the Early Acheulean is followed by several stages which are, at first, free from Levalloisian influence, one is inclined to think that the presence of a core and flake technique in a *coup de poing milieu* of early date is not necessarily evidence of the appearance of proto-Levalloisian, but rather due to the tardy borrowing of a Clacton or other early flake technique, which was especially suited to the production of cleavers.

In East Africa, as in South Africa, the earliest appearance of the true Levalloisian (with tortoise cores and faceted striking platforms) as a contemporary of a *coup de poing* group was in Upper Acheulean times.

T. P. O'BRIEN.

African Prehistoric Research Expedition,
c/o Standard Bank of South Africa, Ltd.,
Kampala, Uganda.

[1] NATURE, 135, 620, April 20, 1935.
[2] NATURE, 136, 53, July 13, 1935.
[3] NATURE, 135, 371, March 9, 1935.

## Emission of Positrons from a Thorium-Active Deposit

USING the magnetic focusing method, we have investigated the energy distribution of the positrons emitted by a source of thorium-active deposit. The positrons were registered by counting the coincidences they produce in two Geiger-Müller counters[1]. The source from which the positron emission was observed was an aluminium strip 10 $\mu$ thick activated with thorium B + C. The total number of positrons was about 0·02–0·03 per cent of the number of $\beta$-particles from thorium C + C″.

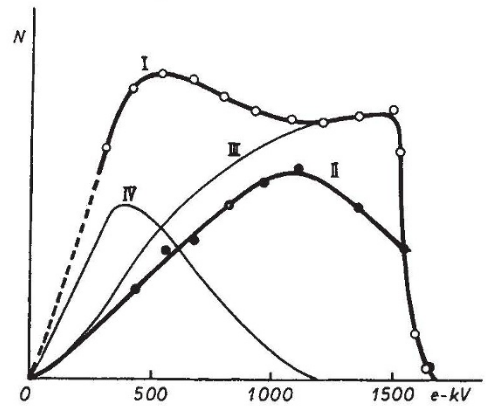


FIG. 1.

Chadwick, Blackett and Occhialini[2] inserted a weak preparation of thorium-active deposit in a cloud chamber, and observed a few (24) positron tracks issuing from the source. According to their data, the number of positrons was nearly 1 per cent of the number of $\beta$-particles, about 50 times the ratio we find in our experiments, but their statistical error was large. We have also compared the number of positrons emitted by the source with the number obtained by the process of materialisation of $\gamma$-rays from thorium C″. In this experiment the same source was surrounded by a lead shield 3 mm. thick; in this case the number of positrons measured was four to five times greater than with the source uncovered. In Fig. 1, curve I, the energy distribution curve of positrons emitted by the thorium-active deposit is given. For each point on this curve about 1,500 particles were counted, the statistical error being thus not greater than 3 per cent. The very abrupt fall of this curve near the end of the spectrum corresponding to the energy $h\nu - 2mc^2$ should be noticed. For comparison, we give a positron distribution curve, II, obtained by irradiating a lead strip 25 $\mu$ thick by the $\gamma$-rays from thorium C″. The asymmetry of this curve shows very clearly the effect of the nuclear field on the positive charge of the positron.