Age implements were found about a mile farther up in the same valley in the sealed Cave of Hearths deposit[9]. The general stratification of the Limeworks breccia, the basal grey layer of which afterwards yielded repetitive discoveries of *Australopithecus prometheus* and the concomitant fauna, was described at the first Pan-African Congress on Prehistory at Nairobi[1]. Up to the present time, as at all other australopithecine sites, no stone artefacts have been found in the grey breccia or in the superincumbent 25–50 ft. of lime-consolidated cavern deposit.

The 40–60 ft. of consolidated and semi-consolidated cavern breccia overlying the stalagmitic floor at the Cave of Hearths has been completely excavated since 1947 through the generosity at the outset of the late Dr. Bernard Price and latterly of the Wenner-Gren Foundation. This excavation has furnished a continuous stratigraphical story of human habitation and cultural progression from the Earlier Stone Age of Middle Pleistocene times through the Middle and Later Stone Ages to the recent coming of Bantu and European.

During September and October 1954, however, Mr. C. K. Brain, in the course of the comparative mineralogical survey of the known australopithecine breccias which he has been enabled to undertake by a subvention from the Wenner-Gren Foundation, extracted from the first 5 ft. of the gravel beds overlying the grey breccia in the south-eastern section of the deposit a number of dolomite stones that appeared to him to have been intentionally flaked.

The Kafuan pebble culture of Uganda, so named by Wayland[10] from artefacts found in the terraced gravels of the westward-running Kafu affluent of Lake Albert, is the earliest and most primitive stone culture known in the African continent[6]. Farther south in Uganda it occurs in its Earliest Kafuan form in the 270-ft. terrace of the eastward-running Kagera affluent of Lake Victoria. The Developed Kafuan, while the oldest and most primitive stone culture known in South Africa, first appears in Uganda in the later 200-ft. terrace of the Kagera River (*vide* ref. 6).

The only implemental evidence hitherto found accompanying australopithecine remains are the fractured and worn bones, jaws and horns, that Dart claimed as the by-products of their predatory habits. This discovery of Kafuan-type artefacts in a gravel bed in a stratified sequence of deposits immediately overlying the grey stratum, which nearby in the same cavern system is an australopithecine-bearing bone breccia, is unprecedented. It opens up the astonishing prospect that Makapansgat may place within our grasp in a single South African valley a continuous story of human handiwork and a consecutive chronology of mankind from the dawn of the Pleistocene to the present day. R. A. D.

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OBITUARY

Prof. Enrico Fermi, For.Mem.R.S.

The news of the death on November 28 of Enrico Fermi came as a shock to his numerous friends, many of whom had seen him only a few months previously in his customary strength and good humour. By the public at large he will be remembered as the man who opened the gates to the atomic age: he led the team which, on December 2, 1942, produced the first self-sustained nuclear chain reaction—the first 'atomic pile'. But he had been a leader in the field of nuclear physics long before that. A few months after Irène and Frédéric Joliot had discovered artificial radioactivity in 1934 he showed, with his collaborators at the University of Rome, that neutrons can be used to produce radioactive isotopes of nearly all nuclei. For a year or two thereafter any nuclear physicist who could read Italian was in great demand—he had to translate the short communications which appeared in the *Ricerca Scientifica*, nearly every one revealing some new and startling phenomenon. The discovery of 'slow neutrons', of their strong absorption in selected elements such as cadmium, their ability to disintegrate boron, releasing energies millions of times their own; their diffusion in paraffin wax; the selective absorption of different neutron 'groups' in different elements: seldom has there been such an explosive outburst of brilliant, wholly unexpected discoveries.

Of special significance was the observation that neutron bombardment of uranium caused the formation of active products which Fermi thought were trans-uranic elements. In this he was wrong; they were fission products, elements lighter than uranium, but this was not realized until four years later. So it might be said that Fermi was the first to cause and observe nuclear fission, though he did not recognize it.

All this was the work of a superb experimenter, quick to design relevant tests with simple means, yet equally capable of conducting the wide-flung research and development which led to the first atomic pile. These achievements alone would have secured Fermi an honourable place in the history of experimental physics.

But actually Fermi started his career as a theoretician; and it is for his work in theory that his name will be remembered through household words such as the Fermi statistics, the Fermi theory of beta-decay, and the 'fermion' (any particle which obeys Fermi statistics). It was in 1926 that he applied Pauli's exclusion principle to systems of many identical particles (Dirac did the same independently a little later), and developed the peculiar kind of statistical mechanics required to describe the thermal properties of such systems. In ordinary gases the deviations from 'classical' statistics are irrelevant except at very low temperatures. But Fermi statistics gave the clue to the behaviour of electrons in metals: here was a 'gas' for which even white heat represented a very low temperature, and a great many puzzling facts—such as the absence of any considerable contribution from the conduction electrons to the specific heat—fell into place when Sommerfeld (1928) used Fermi statistics to create the modern theory of electrons in metals.

Fermi's theory of beta-decay was published in 1934. Again it was based on an idea of Pauli: the idea of postulating a 'neutrino'—a light, neutral and practically unobservable particle—to account for the variable amounts of energy missing in beta-disintegrating processes. The theory was immediately successful: it accounted for most of the facts then known and predicted new ones which were duly verified. Some refinements—which fitted naturally into the original framework—were added later, and it is now certain that Fermi's theory gives a correct account of all aspects of the beta-process—the mutual transformation of protons and neutrons—though the place of this process in the general scheme of things is still one of the main mysteries of to-day's physics.

After the War, Fermi returned to academic work at the University of Chicago. The atomic piles he had created were powerful sources of neutrons, and he used them in the experimental attack on fundamental problems, in particular that of the interaction of neutrons and electrons. But he did not neglect theory: his work on the origin of the cosmic radiation (1947), on the production of multiple mesons (1950) and on the interpretation of meson-scattering experiments at the big new synchro-cyclotron was witness to the unabated vigour of his mind.

Born in 1901, Enrico Fermi was quick in establishing his position: professor in Rome by 1928, member of the Accademia d'Italia in 1929, Nobel Prize in 1938. Since 1938 he had lived in the United States, with his wife and two children.

Fermi's strength was not subtlety or high-flown imagination, but strong common sense combined with perfect mastery of his subject. No vagueness or mysticism for him: the essence of his work was clarity. His papers were written in a style so crystal-clear that the tremendous intellectual effort which had created them was out of sight. His lectures were perfectly planned and delivered with the skill and humour of a showman. His personality, unassuming yet dominant, often provocative but always tolerant, forceful and yet easy-going, will be remembered by all who met him. His joy of living was contagious, and his death is a great loss both to the world of physics and to his many friends all over the world.

O. R. Frisch

NEWS and VIEWS

Directorship of the Royal Horticultural Society's Gardens: Dr. H. R. Fletcher

Dr. H. R. Fletcher, director of the Royal Horticultural Society's Gardens at Wisley, has been appointed to succeed Dr. J. M. Cowan as assistant to the Regius Keeper of the Royal Botanic Garden, Edinburgh. Dr. Fletcher graduated at Manchester in 1929 and in the same year was appointed assistant lecturer in botany in the University of Aberdeen under the late Prof. Craib. There he became interested in taxonomy, especially in the flora of Siam. After taking the degree of doctor of philosophy, he was appointed to the staff of the Royal Botanic Garden, Edinburgh, in 1934. There he continued his work on the Siamese flora and graduated doctor of science in 1939. In collaboration with Sir William Wright Smith he has published a long series of papers on the sections of the genus *Primula* in the *Transactions of the Royal Society of Edinburgh*, the *Transactions of the Botanical Society of Edinburgh* and in the *Journal of the Linnean Society*. Then followed a revision of the genus *Omphalogramma* and numerous articles in scientific and horticultural journals on the genera *Codonopsis, Cremanthodium, Aconitum, Potentilla* and *Incarvillea*. In 1951 Dr. Fletcher left Edinburgh to become director at Wisley. After some four years there, he is again strongly attracted to the line of work he pursued for so long at Edinburgh and is returning there shortly.

Mr. F. P. Knight

Mr. F. P. Knight, who is to succeed Dr. Fletcher as director at the Royal Horticultural Society's Gardens, is a Devonian, fifty-two years of age, who commenced his horticultural career in 1915 at Werrington Park, Launceston, Cornwall, at that time owned by Mr. J. C. Williams, who did so much to support George Forrest in his botanical exploration work in Western China. During 1919–23 Mr. Knight was a probationer gardener in the Royal Botanic Garden, Edinburgh, where he worked mainly in the Propagating Department, and helped with the experimental work on plant propagation from cuttings. The experience gained laid the foundation of Mr. Knight's favourite branch of horticulture. After a period of nearly two years as a student gardener at Kew, he was for four years in charge of the Arboretum nurseries there. This was followed by a period with Messrs. Baker's, of Codsall, Wolverhampton, where he specialized in the commercial production of large quantities of rock garden plants, and also supervised the firm's landscape planting activities for two years. He then went to Knap Hill Nursery, Ltd., Woking. In 1940 Mr. Knight was appointed horticultural officer to the Directorate of Camouflage, Ministry of Home Security, becoming senior officer as the work developed. In April 1944 Mr. Knight joined Messrs. R. C. Notcutt's Nursery, Woodbridge, as general manager, and in 1945 was appointed managing director. Mr. Knight has been active in the Royal Horticultural Society, serving on the Society's Floral Committee and the Camellia and Rhododendron Committee. He has been a member for several years of the Technical Sub-Committee of the Roads Beautifying Association.

American Society of Tropical Medicine and Hygiene: Awards

The following awards were recently presented at a meeting of the American Society of Tropical Medicine and Hygiene:

LePrince Award to Prof. B. G. Maegraith, professor of tropical medicine in the University of Liverpool. The award consisted of a medal and a prize of 500 dollars contributed by the Michigan Chemical Co. Mr. J. A. LePrince, after whom the award is named, also received the medal, which had not been struck at the time he was first honoured by the National Malaria Society.

Bailey K. Ashford Award for research on chemotherapy of malaria and amœbiasis to Dr. Joseph Greenberg, of the Laboratory of Tropical Diseases, National Microbiological Institute, National Institutes of Health, Bethesda, Maryland. The award is given to a scientist less than thirty-five years of age and consists of a medal and a prize of 1,000 dollars, furnished by Eli Lilly and Co., Indianapolis, Indiana.