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K. P. OAKLEY

KENNETH PAGE OAKLEY

1911-1981

KENNETH OAKLEY died peacefully on 2 November 1981 at the age of 70. He is survived by his wife Margaret, two sons, and three granddaughters. Behind this bald statement is a background of indomitable courage and a determination not to allow crippling illness to interfere with the quality of his research and thinking, which earned for K.P.O. the respect and affection of all his colleagues and co-workers. It may be unusual for an obituary notice to discuss illness, but in Kenneth Oakley's case, illness was an intrinsic part of his existence. For at least half his life, he knew that he had developed multiple sclerosis and it was horrifying to his friends to see the slow, often interrupted, but inexorable progress of the disease from the first hesitation in his gait to the ultimate invalid chair. The complaint caused his early retirement from the British Museum at the age of 57 but this did not mean an ending of his mental activity or of his academic publications. It was this refusal to be defeated by his illness or to allow it to affect his personality which earned the ungrudging respect and admiration of all who knew him. He remained consistently a man without pomposity, gentle and friendly, able to appreciate the ideas of others and, if necessary, to disagree with them with courtesy allied to conviction in his own beliefs. In my experience, he never lost his temper, his kindness, or his dignity.

Kenneth Oakley was the son of Tom Page Oakley, who was headmaster of Challoner's Grammar School, Amersham. K.P.O. often spoke with affection and respect of his father's love of music and no small ability as a painter in water colours. It may have been his contact from earliest years with these two forms of art which caused him to list his recreations in *Who's Who* as music, art, folklore, and pursuit of the unusual. He was initially educated at his father's school, then at University College School at Hampstead and finally at University College London. In 1933 he graduated First Class in Geology, with Anthropology as a subsidiary subject, and he was awarded the Rosa Morrison Memorial Medal on this result.

Though trained initially as a geologist and with an evident inclination towards palaeontology, Oakley had shown, even in his

school days, a practical enthusiasm for archaeology, and this was to develop throughout his life and gradually transform itself into anthropology. Yet I believe that it was his geological training with its emphasis on the importance of stratigraphy and time, both relative and absolute, which enhanced his later work on the Hominids. Actually his first two publications in a journal were archaeological: 'Woods used by the Ancient Egyptians' (*The Analyst*, March 1932) and 'The Pottery from the Romano-British site on Thundersbarrow Hill' (*Antiquaries Journal*, xii, 2, April 1933).

Oakley had commenced working for a Ph.D. when, in 1934, he was appointed to the British Geological Survey. After only a year there, he moved to the British Museum (Natural History), still as a geologist though in the department of Palaeontology. He was destined to be seconded back to the Geological Survey during the war years but, apart from this service, his whole working life was to be spent in the Natural History Museum, with the last ten years as head of a sub-department of Anthropology.

With all the duties that fell to him, first in the Geological Survey and then at the British Museum, it was not surprising that he did not submit his Ph.D. thesis until 1938. The topic was one of pure palaeontology, on Silurian pearl-bearing Bryozoa (Polyzoa) but he had given prior notice of this study at the 1934 Aberdeen meeting of the British Association and in a paper which he presented to the Royal Society in late 1934.

Although Kenneth Oakley's official connection with the Geological Survey had only been for one year, such is the lag period of publication that for two more years he appeared as author or co-author of a few more works published by the Survey. The most important, in collaboration with F. H. Edmunds, was *The Central England District*, one of a series of Regional Geologies which covered the whole of Britain. When he returned to the Geological Survey during the war years, his time was divided between arduous fire-watching in the South Kensington building and the production of humdrum but very useful 'Wartime Pamphlets', mainly dealing with water supply or British mineral resources. It is tempting to think that his compilation of Parts II, III, and IV of *British Phosphates* drew his attention to the impurities within calcium phosphate and particularly to its ability to take up fluorine, which led to the enterprising pioneer work on fluorine in bones which was to have such important repercussions.

A very important publication in Kenneth Oakley's career came out in 1936 with Professor W. B. R. King as co-author. This was

The Pleistocene Succession in the Lower Parts of the Thames Valley, published by the Prehistoric Society. Although he was already known for his expertise in the field of Palaeolithic stone tools and his training in geology made him able to interpret the Thames terraces using all the information available from stratigraphy, lithology, geomorphology, and palaeontology, this was perhaps the first time that he had exhibited these talents to public scrutiny. This paper has been the basis for much later work on the Lower Thames, including Oakley's own enquiries into Swanscombe Man and the Galley Hill skeleton and their situation in relation to the Boyn Hill Terrace.

As a member of the Palaeontology Department of the British Museum, he had his duty to identify specimens sent in by the general public and also to engage in research. This second facet of his duties was reflected in no less than nine publications during the years 1936–9, dealing mainly with his specialities, fossil sponges and archaeocyathines. At the same time he was exhibiting, perhaps slightly less officially, his interest in archaeology and Quaternary stratigraphy. It is worth listing the subjects upon which he wrote seven papers, occasionally with a collaborator, during these same four years. They were the 1935 excavations at Hedgerley, the source of the tesserae in the Verulanium mosaics, the Pleistocene deposits around Iver, the 135-foot raised beach at Slindon, Sussex, foreign building material in the Roman bath house at Angmering, the prehistory of the Farnham district, and the relation of Middle Palaeolithic industries to the Pleistocene of South-east England. In addition to these there were two works following his collaboration with King on the Lower Thames which were of great significance in themselves and also as pointers to the direction in which he was going.

The first of these was a joint effort with Mary Leakey in the Prehistoric Society's *Proceedings* for 1937. Its full title was 'Report on excavations at Jaywick Sands, Essex (1934), with some observations on the Clactonian industry and on the fauna and geological significance of the Clacton Channel.' This title needs no elaboration to bring home the breadth of enquiry and scholarship which went into the report. Even more of a landmark and a portent of things to come was the extensive report on the Swanscombe Skull. This was the outcome of a special committee set up by the Royal Anthropological Institute to report on two contiguous pieces (a third fragment had not then been found) of a cranium claimed to be of the oldest example of *Homo* found in Britain. It may be said at once that this claim was fully substantiated and

that there was no good reason for not crediting the remains to our own species, *sapiens*, even though the skull-bone was thicker than in its modern counterpart. The report was in many respects only preliminary and Oakley was to make further contributions over the next twenty years or so. In 1957, in a paper published in the *American Journal of Physical Anthropology*, he discussed the Boyn Hill Terrace at Swanscombe in relation to its height above the present-day Thames, its included vertebrate fauna, and the Acheulian artefacts which came in quantity from its gravels, and concluded that the terrace gravels belonged to the Hoxnian Interglacial (Penultimate of Zeuner). Since it had been accepted in the earlier report that the skull fragments belonged to an individual contemporary with the terrace deposits, the position of Swanscombe Man in the geological time scale was now firmly fixed.

K.P.O.'s last major involvement with Swanscombe Man was in 1964, when the Royal Anthropological Institute published Occasional Paper No. 20, bringing together the writings of all the authorities who had participated in its elucidation. Oakley made four contributions: 'The Site of the Discovery', 'The Evidence of Fire at Swanscombe', 'The Stratigraphical Age of the Swanscombe Skull', and (with Elizabeth Gardiner) 'Analytical Data on the Swanscombe Bones'.

When Oakley returned to the Natural History Museum after his wartime interlude at the Geological Survey, he had the responsibility of organizing the exhibits of fossils in the Central Hall and of writing guide-books for sale to the visiting public. From this resulted two best-sellers. In 1948 appeared *The Succession of Life through Geological Time*, written in co-operation with Dr H. M. Muir-Wood. Within fifteen months a second edition, appreciably enlarged and altered, had appeared and so it went on until by 1967 the guide book was in its seventh edition. Shortly after the initial appearance of *The Succession of Life*, Oakley arranged a striking exhibit of Man's attempts to fashion tools from naturally occurring materials such as stone, wood, and bone and subsequently from metals of his own extraction. To explain the exhibit he wrote *Man, the Tool Maker*, which quickly became a classic. First appearing in 1949, it had by 1975 gone through six different editions and four additional reprints, it had been almost simultaneously printed in the USA by the Chicago Press (sixth edition in 1976) and even translated into Japanese in 1971.

K.P.O. was always interested in dating, both absolute and relative, and made frequent use of the post-war discovery of

radiocarbon dating and of the importance of uranium; but it was the use of fluorine in relative dating that he pioneered.

This method depends upon the fact that the mineral apatite, calcium phosphate, is able to take limited amounts of the elements fluorine or chlorine, or the hydroxyl radical, into its space lattice. The water percolating through most geological deposits usually contains a small quantity of fluorine ions and the mineral composition of bone is basically apatite. Hence it follows that a bone buried in sand or gravel should incorporate increasing amounts of fluorine in the course of time and in fact some fossil bones, on chemical analysis, can show percentages of fluorine running to several units.

Oakley was always careful to point out the limitations as well as the potentialities of fluorine dating. The rate of incorporation would vary with the geological and hydrological situation of any buried bone, so that a factor which will convert any analysis figure to an absolute age is impossible. Nor is it possible, on fluorine figures alone, to place bones in their relative order of age if they come from different geological contexts—although sometimes the disparity can be so great that the obvious answer is highly probable. However, it is possible to say whether or not two bones, apparently from the same deposit, are of similar age. If the analysis figures for fluorine are respectively, shall we say, 2.1 per cent and 1.9 per cent, then almost certainly the bones are of the same age. Conversely, if the figures are 2.1 per cent and 0.2 per cent, then the second bone is a later, indeed much later, intrusion into the older bone-bearing deposit.

The fluorine analysis technique was strikingly demonstrated when Oakley and Ashley Montagu conducted a penetrating investigation into 'Galley Hill Man', using this method amongst other lines of enquiry and publishing their joint findings almost simultaneously at the end of 1949 in the *American Journal of Physical Anthropology* and the *Bulletin of the British Museum (Natural History)*. In 1888, a skeleton had been revealed, eight feet down in a gravel working at Galley Hill, Swanscombe, near to where A. T. Marston was later to find the two pieces of Swanscombe Man's skull. For many years there had been hot debate between the claimants for an antiquity equal to that of the Boyn Hill Terrace gravels and those who favoured the date of a relatively modern inhumation. Oakley showed conclusively that the Galley Hill gravels were the thin edge of the Boyn Hill Terrace, and advanced several cogent reasons for regarding the skeleton as an intrusion into them. Finally he produced a table of fluorine analyses from

bones in the nearby Boyn Hill Terrace gravels (ranging from 1.7 to 2.8 per cent), from bones in the Upper Pleistocene gravels of lower terraces on the Thames (0.9–1.4 per cent) and from local Holocene bones less than 10,000 years old (0.05–0.3 per cent). The Galley Hill figure fell conclusively within the last group. It was not until 1961 that Barker and Mackey published a radiocarbon date which, at 3310 ± 150 BP confirmed the young age indicated earlier by fluorine dating.

One wonders for how long before this had K.P.O. been handling and looking with a questioning eye at the cranium and jaw of Piltdown Man, and the other bones of prehistoric animals and the flint tools which allegedly were found with him. Piltdown Man, hailed as the 'missing link' in Man's ancestry, a being with modern man's cranium and a primitive ape-like jaw, was the sensational anthropological discovery of the early twentieth century. There is in the rooms of the Geological Society of London a splendid life-size painting which shows Sir Arthur Keith and Sir Arthur Smith-Woodward examining the skull with the 'finder' who provided the specific name of *Eoanthropus dawsoni*. Even Professor Le Gros Clark in the 1950 second edition of the British Museum's handbook, *History of the Primates*, did not question the authenticity of Piltdown Man, although his doubts come through in the revisions that he had made from the first edition. It was left to Oakley and C. R. Hoskins to send a short article to *Nature* in March 1950, 'New evidence on the antiquity of Piltdown Man', to suggest to the world that the discovery could be a fraud.

This revelation exposed, of course, the archaeological scandal of the century, and K. P. Oakley became internationally known far outside the scientific circles within which he had previously moved with such distinction. Over the next few years, he allied his knowledge of absolute and relative dating techniques, of Pleistocene vertebrate fossils and Palaeolithic artefacts, with the anatomical expertise of Le Gros Clark and the chemical skills of J. S. Weiner. Together they exposed a masterly fraud which had been successful in the 1910s, but which failed before the new knowledge of forty years later. Anatomical investigation showed that the cranium was that of a quite recent man, but the jaw was that of a modern ape. Relative fluorine dating confirmed the recent nature of the skull parts. The ape's molars, which would have revealed the true origin of the lower jaw, had been filed down to simulate human wear and the condyle, which we now know could not have articulated with the cranium, had conveniently been broken off. The iron staining which impregnated all the bones and discoloured

the flint implements to give an impression of great age had been precipitated from a chromate solution. Some of the bones of large vertebrates claimed as coming from the same gravel deposit as the skull were so much at variance with the latter in their fluorine content, and so enormously rich in uranium, that they were recognized as coming from a unique and very old site in Malta.

Shortly after these revelations, De Vries and Oakley published a radiocarbon date on a piece of calvarium from the skull and it was only 820 ± 100 years BP—in other terms, post-Norman Conquest.

Thus Piltdown Man was removed from the textbooks of human evolution and Swanscombe Man returned to the undisputed position of the oldest hominid in Britain.

For a number of years Oakley had worked hard to increase the collections of anthropological and osteological reference material, not only of modern *Homo sapiens*, but of his prehistoric precursors and the early hominids. He undoubtedly wished to see a separate and independent Department of Anthropology set up in the Museum. This was not to be, but at least a sub-department within Palaeontology was created in 1959. Oakley was the obvious choice as its first head and so he remained until his early retirement some ten years later. During that decade he greatly increased the collections and broadened their scope by bringing together much more comparative skeletal material, casts of the more important remains of early hominids, artefacts of many periods and locations, even the expression of artistic talent in the anthropoids. The latter included Upper Palaeolithic cave art as well as an original painting by Congo, a chimpanzee at the London Zoo. The Natural History Museum, thanks to K.P.O.'s enthusiasm, now houses one of the finest anthropological collections in the world.

The two decades 1950–70 were a very fruitful period of Oakley's life. He produced many significant papers and in the earlier decade became heavily involved in the exciting new discoveries in Africa, Asia, and Europe. He visited numerous sites and attended congresses such as the Pan-African Congress in Prehistory. His output of papers was prolific. New facets of the Piltdown fraud repeatedly cropped up and requests for their elucidation came from all parts of the world. The fluorine test was applied to almost every new discovery of ancient hominid bones, and, where practical, radiocarbon assay was also used. Oakley established the true age of the 'Red Lady of Paviland' (who was actually a young man). This skeleton had been found in one of the caves of Gower as far back as 1822 and had been described in the

same year by Dean Buckland at Oxford. By publishing a radio-carbon date of nearly eighteen and a half thousand years, Oakley firmly placed the skeleton in the Upper Palaeolithic period.

During these two decades Oakley barely slackened in his interpretation of archaeological discoveries, especially those where human remains were found. Whenever or wherever these occurred with a possibility of their being old, or when more ancient discoveries were re-excavated, K.P.O. was usually asked to organize a fluorine test and comment upon the significance of the result. A cursory glance at his list of publications shows contributions on Rhodesian Man, a skull at Westley (Bury St. Edmunds), Halling Man, skulls and bones from the Cheddar caves, a skeleton in Texas, remains from the classic Olduvai site, from Fontchevade and La Denise in France, from the very significant Vértesszöllös in Hungary, and half a dozen more.

Shortly before his retirement, Oakley embarked upon a systematic catalogue of fossil hominids and in 1967, collaborating with B. G. Campbell, he published Part 1, 'Africa'. Part 2, dealing with Europe and having the addition of Thea Molleson as a co-author, appeared in 1971, and Part 3, 'The Americas, Asia and Australasia', in 1975. All these were considerable works of compilation, reflecting many years of study. Part 1 came out as a second edition as late as November 1977.

Kenneth Oakley wrote only one book under his sole authorship. *Frameworks for dating Fossil Man* is divided into three parts. The first deals at length with the principles of stratigraphical dating and records the time-sequences which have been postulated in many parts of the world from the application of these principles. Part 2 deals equally comprehensively with the succession of stone implement techniques and typologies, and Part 3 comprises 16 tables of the dating of the more important fossil hominids (and some controversial ones). The book was conceived in 1958, mostly written by 1961, and in 1964 was published by Weidenfeld and Nicolson in London. It was an immediate success. Second and third editions appeared in 1966 and 1969, The Aldine Press in Chicago reproduced these three editions for transatlantic consumption, and in 1971 it was translated and published in West Germany.

Although the last ten years of his life were spent in retirement with ever-increasing disability, there was no impairment to his active mind. He continued to write articles, with an increasing tendency to dwell upon Man's development of thought and intellect, on his accelerating skills and inventiveness, and upon his

discovery of fire and how fire could be controlled and used. When it was no longer possible for him to travel abroad to visit the exciting sites of new discoveries and talk with the experts there, these eminent people came to his house in Oxford. Professor Martyn Jope (to whom, and to Dr Thea Molleson, I am much indebted) has recounted to me some of these meetings with their stimulating discussions. Oakley encouraged the development of new ideas and methods of research, such as the understanding of the problems of thermo-luminescent dating and progress in eradicating these difficulties, work on ancient and fossil proteins, and the molecular aspect of the emergence of hominization.

Martyn Jope has described to me a long discussion with K.P.O. which took place outside a shop in Little Clarendon Street in 1974, when together they hatched the plan (as he put it) for the Royal Society and British Academy joint symposium on *The Emergence of Man*, which eventually took place in March 1980. Oakley was a powerful help in moulding the programme and in attracting important speakers from distant places. What is even more notable is that he contributed his own penetrating paper on 'The emergence of higher thought, 3.0-0.2 Ma BP' (*Phil. Trans. R. Soc. Lond.*, 292B, (1981), 205-12).

I have two poignant memories of Kenneth Oakley during his enforced retirement. In April 1976, when the Quaternary Research Association visited Oxford, we went to the University Museum one evening and Oakley was there in his invalid chair, to greet old friends, make new ones, and to discuss matters personal, archaeological, and anthropological with all and sundry. Later, and very shortly before he died, he wrote to me for advice on the distribution of the few personal copies he had of the much overdue *Bulletin of the British Museum (Geology)*, 34 (1) on 'Relative dating of the fossil Hominids of Europe'. He was exceedingly pleased that at last a summary of so much of his life's work had appeared. For those of us who have a copy, it will be a constant reminder of a very wise and brave man.

F. W. SHOTTON