



MARY LEAKEY

Mary Douglas Leakey 1913–1996

OLDUVAI GORGE IS KNOWN throughout the archaeological world and far beyond, as the place where the search for our human origins was fired anew in 1959 by Mary Leakey's discovery of the robust Australopithecine cranium known affectionately as 'Dear Boy' or 'Nutcracker Man'. This was the first of a series of major fossil hominid discoveries in East Africa that have fully confirmed Louis Leakey's conviction that Olduvai Gorge would prove to give a unique record of the evolution of the human lineage and of the changing geological and ecological events that were the backdrop to this record, which covers the last two million years.

Louis was convinced, firstly, that East Africa was the place where humankind evolved and, secondly, that the best chance of finding the biological and cultural evidence of this was at Olduvai Gorge, in northern Tanzania, especially after his first visit there with Hans Reck in 1931 when he found Acheulian bifaces within twenty-four hours of searching the outcrops. Mary's first association with the Gorge was in 1935 when the first systematic survey was undertaken; from then on her name has become synonymous with that of Olduvai. If Louis furnished the inspiration for the renewed search, it was Mary who provided the fulfilment, and her name and that of Olduvai are now the best-known names throughout the world of palaeoanthropology. The continuous stratigraphic record covering the last two million years is the most important and complete coverage of the evolution of our own early hominid ancestral species. This is a record of changes in environments, animal and hominid populations and the behavioural adaptations that have made us

Proceedings of the British Academy, 111, 595–614. © The British Academy 2001.

what we are today. This knowledge comes from the work of numerous specialists and team members. However, the person who directed the research, advanced understanding, and held it all together, both before and after Louis' death in 1972, was Mary. Not only did she continue to direct the Olduvai research and that at Laetoli, but she also took over the onerous lecture tours in Europe and the United States to ensure the continued funding of this research. As the results show, Mary was fully equal to this task. Moving to live at Olduvai in 1968 gave her almost year-round possibilities for field survey and excavation and the time necessary to produce the outstandingly fine publications of the results of her meticulous excavations of the activity places of ancestral hominids. Mary Leakey is the outstanding pioneer of the study of early hominid living, or activity places and so has made possible the new land use studies of the present time.

It seems likely that the persistence and overriding interest that Mary and a few other investigators have in the study of the past is something inherited. Some of Mary's devotion to archaeology may have been inherited through her English mother, from her direct ancestor John Frere, a Suffolk squire who, in 1797, on finding worked flints (handaxes) with the fossil bones of extinct animals in his brick-pit at Hoxne, declared them to belong to 'a very remote past indeed, even beyond that of the present world'. Just how remote that world was is now shown by Mary's researches in East Africa.

From her Scottish father and grandfather, the painters Erskine Nicol, Mary also inherited the gift of drawing and illustration. From the 1930s onwards, Mary's illustrations provide a visual record of how archaeological research has progressed. Her illustrations of artefacts (mostly stone tools but also pottery) and detailed stratigraphic section drawings and maps accompany such classic volumes as *The Desert Fayoum* (G. Caton-Thompson, 1934), 'Report on the excavation at Hyrax Hill, Nakuru' (Leakey & Leakey, 1945), *Excavations at the Njoro River Cave* (1950), 'The Pleistocene Geology and Prehistory of Uganda, Part II' (C. Van Riet Lowe, 1952) and, of course, *Olduvai Gorge, Excavations in Beds I and II, 1960–1963* (1971) and *in Beds III, IV and the Masek Beds 1969–70* (1994). Her illustrations of stone artefacts in particular, enable us to appreciate the traditional skills of the Palaeolithic makers, for Mary's understanding of stone technology not only faithfully depicts the technical level of the knappers and their ability to produce utilitarian tools and weapons but also reflects the subtleties of their aesthetic comprehension and regional patterning, which become increasingly apparent in some of Mary's illustrations of their more finely made artefacts.

Archaeologists have to work with artefacts enabling them to have a clear understanding of what they are reading about. When the collections themselves are not available, good illustrations are essential. There are few that equal those of Mary Leakey. The fullest expression of her artistic ability is seen especially well in her reproduction of the rock paintings in central Tanzania. Indeed it was her illustrative ability that was responsible for her introduction to her husband Louis, who was looking for someone to illustrate stone artefacts he had found on his first expedition to Kenya in 1931.

Mary's early archaeological training and experience was in Europe and East Africa only came later. It was the summer visits to France and Les Eyzies with her parents that first endeared Palaeolithic archaeology to Mary. She explored the paintings and engravings in the caves of the Dordogne and went on long walks in the surrounding country with the local Abbé, an amateur archaeologist. She also watched Dennis Perony's excavations at Laugerie Haute and collected Upper Palaeolithic artefacts from his spoil heap which, due to the unscientific excavation methods of the day, yielded many fine pieces to a young collector. Such experiences were surely the foundation on which Mary's future career was based and surely there is no finer place from which to begin.

Mary's father died when she was thirteen and this was a severe blow. Back in England, after a series of governesses, Mary was sent to a series of Roman Catholic convent schools where her independent character was expressed in various ways that led to her expulsion, the second time for intentionally creating an explosion in the chemistry laboratory. In her mid-teens Mary decided she wanted to become an archaeologist of the down to earth field variety and attended lectures in geology and archaeology, the latter with Sir Mortimer Wheeler. So, as Thurston Shaw has said, she offered her untrained services to a number of archaeologists, only in most cases to receive a polite refusal. She was accepted by Sir Mortimer Wheeler excavating at St Albans but she did not find him sympathetic and left after a week, later joining Dorothy Liddell excavating the impressive Iron Age hill fort at Hembury in Devon, which was found to incorporate an underlying Neolithic causeway camp. At seventeen this was Mary's first excavation under the tutelage of Dorothy Liddell and Alexander Keiller's skilled excavator from Avebury. She learned meticulous excavating techniques and her later excavations continued to follow the high standard learned during the course of four seasons at Hembury. Mary remained eternally grateful to Dorothy for the kindly and skilled instruction and comradeship she received at this Devon site.

Gertrude Caton-Thompson, well pleased with Mary's illustration of the Desert Fayum, introduced Mary to Louis Leakey, back from the Kenyan Rift with his large African collection of artefacts, which he asked Mary to illustrate. Mary was attracted to Louis whose personality was infectious. He was full of energy, enthusiasm, and indeed exuberance, which endeared him to many in the years to come. Young, innovative, and ambitious, he was a pioneer in beginning systematic study of the Palaeolithic which sometimes brought him into conflict with the establishment back in Cambridge where he received his training under Miles Burkitt. His book *Adam's Ancestor's* (1934), strove to show lithic technology in a new light and the contexts of the assemblages and what they might say so far as behavioural implications were concerned. Mary became infected by his enthusiasm for the Palaeolithic and excited by his interest in the Acheulian biface tools. He took her to excavate assemblages of Clacton and Acheulian tools in the Thames-Valley terrace gravel pit at Swanscombe, later to yield the first part of a human cranium, and with Kenneth Oakley at the Clacton type-site. Digging the Acheulian and Clactonian were good preparation for the East African Paleolithic, first seen by Mary at Olduvai in 1935 when Laetoli also was first visited.

In January 1933, Mary and her mother sailed to Cape Town to meet John Goodwin, the archaeologist at the University of Cape Town, and to visit sites in South Africa and Rhodesia. She received valuable help and was grateful to Goodwin, and assisted him with his excavation at the Oakhurst Rock Shelter, learning methods of cave excavation and recording. Mary also studied with Neville Jones, at Bulawayo in Rhodesia (Zimbabwe), then went on to meet Louis at Olduvai Gorge. Louis's first marriage ended in divorce in 1936 and at the end of that year, in December, Louis and Mary were married. This was the beginning of the most important partnership in the search for and discovery of the fossil, biological, and cultural evidence of the human ancestral record. After an idyllic and very busy stay in and around Cambridge, where Louis wrote several books illustrated by Mary and where she gained much knowledge of Palaeolithic sites and cultures, they set off for Kenya where Louis had been asked, by the Rhodes Trust to write a social anthropology book on the Kikuyu.

Mary's introduction to Olduvai Gorge was with the 1935 expedition and was a turning point in her life. She was excited by the great height of the Gorge, the many depositional series of sediments it contained and the very rich scatters of fossil bone and stone artefacts littering the eroded slopes, and which came from discrete buried land surfaces. Several small-

ish excavations were done by Louis and Mary and the geologist Tindall Hopwood in the Gorge, exposing a long record of cultural and biological evolution from simple pebble tools (Oldowan) at the base to finely made handaxes and cleavers (Acheulian) at the top. The first volume on Olduvai in 1965 contained some of the best and most complete sets of Olduvai Acheulian bifaces yet published, illustrated of course by Mary. It was, however, a subjective, incomplete, record as Mary's subsequent excavations demonstrated. For Mary 1935 provided a spectacular introduction to African archaeology and was full of splendid surprises, not to mention the difficulties with transportation vehicles and supplies, since there were virtually no roads from this roadless part of the Masai Step. The hazards in those days were considerable and much different from those of the present day tourists visiting Olduvai, who now travel and view the sites in comfort from Land Rovers and have the luxury of tents, hot water and fine meals.

From Nairobi Louis and Mary visited the sites he had found in 1929 and 1932, and I will always remember being taken to visit many of these. I met Mary for the first time in 1941, prior to moving with the Northern Rhodesia Regiment to the Horn and the Italian campaign. It was a great privilege to be shown the sites in the Kenya rift, and Louis and Mary became firm friends throughout the rest of our lives. They were living in the old house adjacent to the museum surrounded by a fence that contained Mary's Dalmatians, which she continued to breed for a number of years. When visiting them, one was surrounded at the gate by some six or more of these vociferous and affectionate animals.

As opportunity offered both Louis and Mary engaged in some excavation and in the restoration of skeletal material, ceramics and artefact analysis, working from the Coryndon Memorial Museum (now the National Museum of Kenya). Some of the best illustrations of early Iron Age Dimple Based Wares are Mary's from the Weenan gulf, together with those of Archdeacon Owen's 'Kavirondon Industry'. It was Archdeacon Owen who guided Mary's first visit to Rusinga Island in the gulf in the early 1940s. Her first visit there was followed by a systematic collection and excavation and the discovery of the fossil *Proconsul*, the now well-known early Miocene ape.

Back in Kenya in 1937, when Louis was writing the book on the Kikyuyu, Mary first showed her skill as an excavator at the Neolithic and Iron Age settlement site and cemetery of Hyrax Hill near Nakuru, and her detailed monograph on this shows it to have been the first systematically and meticulously excavated site in East Africa. The next year, 1938,

there followed the excavation with Louis of the Elmenteitan burial site at Njoro River Cave on the Mau Escarpment. The remarkable, partially cremated, remains required great skill and long hours and patience in excavation and recovery of the uniquely carbonised belongings buried with the bodies. There is no doubt that it was Mary's careful techniques that successfully preserved the netting and basketry and wooden and gourd vessels. No doubt also it was her fieldwork at Hembury with Dorothy Liddell, her association with Gertrude Caton-Thompson and John Goodwin, and I suspect (although I do not think she would agree) the recognition of the need for precision in excavation which Mortimer Wheeler taught and always used, that gave Mary the preparation needed for working on the Palaeolithic in Africa. But the perception that some early African sites remained little disturbed and so might be made to show for what and how they had been used, if they were skillfully enough excavated, as well as developing the techniques to do this, are of Mary's own devising. This new approach and the new methods were first put into practice, so far as I am aware, at the Middle Pleistocene site of Olorgesailie in the 1940s. Up to then, the Eurocentric approach to Palaeolithic studies, inherited from the all too often derived situations of artefacts in river gravels and other secondary contexts, had inhibited thinking of the Palaeolithic as preserving rich lithic and bone finds on sealed living sites and so excavating them, in the way a Neolithic or other early food-producing settlement was excavated. Mary and Louis Leakey changed all this with their discovery and excavation of artefact and bone assemblages on old land surfaces that appeared to have been little disturbed. Common at the Somme in France and Worthington-Smith at Caddington and Stoke Newington in England had done so in the last century, but their work had been forgotten and was never followed up until many years later. It was Mary's painstaking uncovering of the Olorgesailie surfaces around an old lake in the Rift Valley south of Nairobi that alerted prehistorians in Africa and more generally, to the existence of 'primary' context Palaeolithic sites and the possibilities of learning something about the life-ways of the early humans that used them. Louis and Mary found Olorgesailie in 1942 coming on the remarkable spread of Paleolithic bifaces together and Mary began excavating, continuing on and off for the next three years. This unique spread has been preserved to this day and can be seen by tourists visiting the site from the famous 'Cat-walk'. I was most impressed to see these excavations when I was in Nairobi in 1943 and when coming out of Somalia at the end of the war in 1946. The advantage of being able to see an undisturbed horizon with

features, artefacts, bone and natural objects on it, just as they had been in life before the surface had been buried, were both apparent and exciting. This method opened up entirely new ways of trying to understand the meaning behind such a distribution and, of course, this is now the recognised way of excavating Early Stone Age sites, both in the continent and elsewhere. Mary's pioneer research offered the realisation that the archaeological residues might and indeed have been made to come alive.

Palaeoanthropologists have not learned quickly, however, and at first almost any concentration of artefacts and bone was pronounced to be of human origin. The initial subjective interpretations gave place, in due course, to more discriminating ways of identifying the sequence of events or history of a 'site'. So a more critical approach followed with the pioneer taphonomic studies of C. K. (Bob) Brain and others on bone modification and dispersal; the establishment of uniformitarian controls, advocated and initiated by Glynn Isaac, dealing with the ecology of how plants, animals and humans interact, experimental projects relating to plants and animals in the wild, on gauging the effects of natural agencies such as water, wind, and chemical phenomena, and technological experiments in stone artefact manufacture, use, modification, transportation, and discard, all leading to a corpus of comparative standards still under construction. These and increasingly new controls from laboratory studies such as carbon and oxygen isotopes with tephrochronology, which make possible new understanding of the environment and correlation between stratified sequences over long distance, and many more, are the basis for forming hypotheses and the construction of alternative models for early human behaviour that can be tested against the established, actualistic controls as they become available.

There is nowhere better than Olduvai Gorge for providing the hard data on which hypotheses and models are based. That we are now able to use Olduvai Gorge in this way is entirely due to Mary Leakey and her specialist colleagues and to the many years of devoted work in uncovering and laying bare the record of the human career. It is an exciting and extremely rich record made all the richer and more significant from the input of those working to complete the picture of the changing world of the Pleistocene and its chronological framework.

Such constructs are only possible because of rigorous excavation methods and precision in recording and preservation. It must be emphasised again that it was Mary Leakey who initiated these methods in Palaeolithic studies in Africa, but although they are now generally practiced worldwide, their recognition and use took a while to spread. One

stimulus to using these new approaches came from the Pan-African congresses, of which there have now been ten, the first of which came about in 1947 due to Louis's and Mary's inspiration and motivation. This congress and those that followed were without equal in the international and interdisciplinary stimulus they provided for African archaeology.

The 1947 Pan-African congress brought together geologists, palaeontologists, archaeologists, and palaeoclimatologists working in Africa to present papers, discuss them and make visits to the main sites in Kenya and northern Tanzania. Logistics and organisation were considerable but paid off. It was a tremendous success and as with the later congresses, led to a community of friendships, the sharing of information and the forming of international teams of specialists working in various parts of the continent and further afield. Louis laid the foundation for this kind of teamwork in his books *Adam's Ancestors*, his Munroe Lectures in Edinburgh (Stone Age Africa, 1936). Initially these volumes emphasised the use of lithic technology and experimental uses of stone tools and the geological, climatological, and palaeontological contexts for early African stone tool assemblages. These were the first initial attempts to show that Stone Age technology and typology can provide new evidence on the intellectual abilities of the makers, and to describe the evidence from geology, palaeontology and the contexts of the archaeological assemblage in the different regions of the continents. These congresses, which should be held every four years, are the main decision making body on progress in lithic and Iron Age studies concerning terminology, and typology, and are the agencies for bringing matters of importance concerning control of sites and antiquities to the attention of the various different governments concerned.

Another stimulus came from the series of intimate conferences and symposia organised by the Wenner-Gren Foundation for Anthropological Research in their summer research centre, Burg Wartenstein, in Austria, where future policy was planned and initiated. These kinds of roundtable interactions were without equal for what they did for African archaeology and, indeed, the whole field of anthropology in general. Louis and Mary were at more than one of these and I shall never forget the amazement on the faces of some of the participants when they saw and handled Oldowan and Acheulian small tools at the 1965 symposium on the 'Systematic Investigation of the African Later Tertiary and Quaternary', brought by the Leakeys from Olduvai. Previous recovery methods were such that small tools had often not been recovered or, if they had, they were considered to be of much later age and to have found their way

down from higher levels in the deposits. Mary has been a participant at many larger conferences and international congresses, and her lecture tours in Europe and the United States have made her name known world wide so that, most fittingly, she received the highest recognition from the academic and scientific world for her achievements.

Louis Leakey always talked about 'Leakey's Luck' and his hunch that East Africa would provide some of the earliest evidence for human biological and cultural evolution. Luck was certainly with them in that he and Mary were working in the one part of the world that, for the time period in question, would provide the most complete and abundant record of human biological and cultural evolution. But it was Mary's assurance, determination, and perseverance, as well as the shared excitement and joy coming from new discoveries that have made her East African researches so rewarding and crucial.

The year 1947 was a busy year for the Leakeys, after the congress they took a small number of participants to visit Rusinga Island and the Miocene fossil sites that resulted in a series of adventures. Later that year, following an invitation from Jean Janmart to visit the archaeology buried in the deposits of the Diamang diamond mines in north east Angola, they studied the long sequence of Quaternary cultural industries and sequence of Kalahari sands and fluvial sediments in the valleys, and their reports were published by Diamang in 1949. Also as a direct outcome of the congress and the support of Sir Wilfrid Le Gros Clark and the Royal Society, the British-Kenya Miocene Expedition was formed to systematically survey, excavate, and record the results. Louis and Mary were with the Expedition from 1947 to the mid 1950s and the whole family made annual visits. It was in 1948 that Mary found the famous *Proconsul* fossil hominoid comprising the face, jaw, and one side of the skull. This was of global importance. When it was found in small fragments, Mary spent many hours and days meticulously reconstructing the specimen. Mary said she was not all that interested in the Miocene fossils, but the discovery of *Proconsul* was the most important find of her life. She was to appreciate its importance when she travelled by air to London to hand it over to Sir Wilfrid and was met at the airport by many from the media eager to learn the details of its discovery. But *Proconsul* was not the only important discovery Mary made in the Miocene at Rusinga and Mfangano Islands. Breaking open silicate concretions they were found to preserve insects three dimensionally (beetles, spiders, and grass hoppers) and plants in amazingly complete preservation. All kinds of insects including ants were preserved together with many identifiable plant seeds.

This was some of the earliest evidence of insect preservation some eighteen million years ago.

In 1950 the whole family returned to England, and while staying in Surrey at Elmhurst they undertook an excavation of a Mesolithic camp with what Louis interpreted as a pit dwelling. During the visit they met Axel Wenner-Gren who founded the Wenner-Gren Foundation, which was supportive and impressed by the Olduvai work, and its director Paul Fegos. They toured the French caves in Perigord and the Pyrenees and Altamira paintings with Charles Boise, who had so generously funded the Miocene work. This was a nostalgic visit for Mary but not the highlight, which was a visit to the recently discovered Lascaux paintings. The visit to England ended with the conferring of an honorary degree on Louis by the University of Oxford, and thirty years later the same university conferred a similar degree upon Mary.

Back in East Africa early in 1951 Charles Boise had been taken to visit the Kenyan sites, Olduvai and the Kiseke rock paintings and he established the Boise Fund at Oxford University to support the work of Olduvai and other sites for the next seven years. Today the Boise Fund is still an important source of funding for palaeoanthropologists and archaeologists in Africa. This financial support was a turning point in the work at Olduvai and meant that a systematic programme of work could be set up. This meant that Mary, for the first time in sixteen years at the Gorge, was also able to make a three-month full study of the Kondoa Irangi rock art, and record by tracing and colouring by hand the Kiseke Rock paintings she had first seen in 1935. In all she located 126 sites of which 43 were studied providing 6000 individual figures and styles. Mary always thought of this work as one of the highlights of her life. She obtained a great deal of joy and pleasure from those stimulating and beautiful paintings, which she later brought together in an outstanding volume, *Africa's Vanishing Art* (1983). Copying the paintings was not an easy task as there was not a little superimposition of one painting over another, and this was exciting, but a painstaking task for Mary. For those who cannot visit the sites themselves, Mary reproduced some of the main scenes of humans and animals on moulded rock surfaces, which are housed at the National Museum, Nairobi, for all to see and enjoy. Unfortunately, the painted shelters themselves have suffered the depredations of many herd boys scribbling across them.

In 1952 the family moved to a free holding at Langata, a then rural suburb of Nairobi. This was the time of the Mau Mau movement and with its ensuing violence among the Kikuyu the Leakeys' Langata house

was built to resist an attack with few out-looking windows and an interior courtyard designed by Louis and the family. Louis considered himself a Kikuyu and was deeply involved in a number of ways including writing a book on the uprising and being the official interpreter for the examination of Jomo Kenyatta. The Langata house was in the bush and was surrounded mostly by rhinos, giraffes, cheetahs, lions, and many other animals including snakes, the affectionate monkeys, hyraxes, and bush babies.

At Langata Mary continued breeding her Dalmatians and kept horses to the great pleasure and excitement of the three boys, each of whom had his own pony. Mary was instrumental in founding the Langata Pony Club, which remains the leading club in Kenya today. Besides the dogs there were always free ranging hyraxes and genets and sometimes a pair of dik-diks around the courtyard. Indeed the hyraxes were family members, for visitors were instructed to make sure that the lid of the lavatory was always left open at night for the likable creatures, who invariably used it. Between 1951–8 Louis and Mary, with the help of Heslon Mukiri their long time foreman of excavations and Wakamba workmen, carried out several small-scale excavations in the upper part of Bed II, with tools found but no hominids. At BKII and SHKII, two interesting sites in a sticky clay stream course, it appeared that animals might have been driven, bogged in and slaughtered since there were many stone tools of Developed Oldowan type in association. Alas, no hominid remains were found here. A re-examination of the Laetoli sites found by Kohl-Larsen and earlier German geologists was dissatisfying, but on returning to Olduvai they turned their attention to the older Bed I deposits, where during their absence, Heslon had found a hominid tooth at the MNK site. On the 19 July, while Louis was in bed with influenza, Mary went down to the FLK site where there were plenty of artefacts and bone on the surface. Here Mary found what turned out to be part of a skull buried in the sediment and brushing away the deposit, found some massive molar teeth, and so the cranium and face with complete upper tooth row was found. It was a robust Australopithecine and the first early hominid from East Africa, which they named *Zinjanthropus boisei*, after Charles Boise. This was the major discovery they had been waiting for, and the excavation of the specimen was captured on film by the photographer Des Bartlett who was visiting the site, and so its excavation attracted wide public attention, and indeed that of the scientific world, to the importance of the Pliocene and Quaternary sediments and the fossils and cultural evidence they contained in the East African Rift Valley. The

publicity this discovery received resulted in the long-time support and funding of the Leakeys' work in East Africa, in particular of Mary's extensive excavations in Beds I and II, especially the FLK site in Bed I, which yielded a primary context living floor of the makers of the Oldowan Industry.

Mary excavated continuously for a year the 'Zinjanthropus Floor', as it was called in 1960. Also during this time, other horizons and sites in Bed I and the base of Bed II were located and excavated by Mary. The most important was that of FLKNI, a little above the 'Zinjanthropus floor' which yielded the cranial fragments, mandible and some post cranial bones that were later described by Louis, Tobias and Napier as *Homo habilis*. I was invited by Louis in 1960, together with Raymond Dart and Camille Aramburg, to visit Olduvai and examine the witness section of the Zinjanthropus floor, left for us to study, in 1960. It was a never to be forgotten experience to see the concentration of bone, stone and significant grouping to form features, notably a possible base for a wind-break. At this time we also carried out an experiment in bone breaking and the study of the broken leg bone shaft and fragments spread on the surface in much the same way as that on the fossil horizon. This was a unique experience for the three of us to see part of a fossil land surface with the relatively undisturbed early evidence of human activities. This excavation of other Bed I, FLK North surfaces resulted in the discovery of a dismembered skeleton of an extinct elephant together with Oldowan type stone artefacts that appeared to have been used in connection with the dismemberment and butchery of this animal. Another discovery at the base of Bed II was that of a complete Deinotherium skeleton also with tools, which showed the tremendous potential of Olduvai. Mary's meticulous excavation, plotting of everything on the surface and carefully numbering and recording of all fossils showed how much behavioural information could be extracted from such detailed work and others began to use her methods as these became available. This was a time also of specialist collaboration of geologists to interpret the complex history of the gorge. Richard Hay's many seasons work and his *Geology of the Olduvai Gorge* (1976) is the essential basis for all the climatic, environmental, and earth movement changes against which to study the hominid activity sites. At this time also, Evernden and Curtis had developed the Potassium-Argon method of radiometric dating (1959). Their visit to Olduvai and other sites in East Africa provided the first reliable frame for dating the hominid fossils and the cultural assemblages. It showed the much greater antiquity than previously supposed of the human evolutionary record.

Mary continued doing field work at Olduvai while Louis undertook lecture tours in the United States and Europe to raise funds, which in 1968 resulted in the LSB Leakey Foundation for Human Origins Research, to provide them with financial aid in their various field works and to relieve them of pressure and enable them to continue uninterrupted research with Philip Tobias and John Napier. The Foundation is today the foremost Foundation devoted to palaeoanthropological research.

One unfortunate outcome of an early visit to California found Louis supporting a belief in an early man site at Calico Hills in the Mohave Desert. It took an international meeting of specialists to convince him that the occasional fractured flints in the Pliocene conglomerate were in fact only part of the many fractured stones broken by pressure in this accumulated fan gravel. Mary would have nothing to do with it and refused to visit this site.

The 1960s also produced a number of hominid fossils and activity surfaces. At DK1 Mary found at the base of Bed I, with systematically piled artefacts and bones, a crushed hominid skull. A further interesting fossil is a greatly fragmented cranium of another habaline affectionately known as 'George' from MMK1. At LLK2, in the upper part of Bed II, was found a cranium of *Homo erectus*.

By 1968 the partnership began to break up and Mary was ready to start a new program of fieldwork in Beds III, IV, and in other sedimentary beds in the Gorge and to be able to devote her time more fully to the work, so she established a permanent camp at Olduvai. These upper Beds were less rewarding than those in Beds I and II, since the artefacts and fauna were more often in secondary context in stream channels. They nevertheless provided valuable evidence for the later part of the Mode II (Acheulian) and the Developed Mode I (Oldowan) artefact assemblages, with fauna and one hominid fossil limb bone from WK4. Earlier work of a very fragmented and scattered human skull which had eroded from Bed IV at the VEK site, involved a large scale scraping of the down hill eroded slope which recovered all eroded bone fragments and which produced most of the hominid cranium, which so far as I am aware has not yet been described. Beds III and IV contained many kinds of assemblages, some with large biface handaxes, cleavers, and picks of Mode II. Other assemblages of Mode I type included small crudely made handaxes, flakes, and core/choppers, which have been described by Mary as Developed Oldowan. Dating these beds is not easy but they appear to be younger than 1.2–2.0 million years at most. They are still within the 'early

Acheulian' and only the overlying Masek Beds contain the finely retouched regular bifaces of the later stages of the Acheulian.

Working with her over this period at Olduvai and Laetoli was Peter Jones from Oxford, who became a very skilled experimental knapper and who has thrown much light on the technology used to obtain the large flakes from which the handaxes and cleavers were made. He also made important identification of the sources of the different raw materials used by the hominids and calculations of their respective distances from the activity areas. Another important outcome of Jones's work was the discovery, with Mary, that the quartz and quartzite used to obtain the smallest flakes involved the bipolar technique, namely by resting the core on a stone anvil and striking the upper end with a stone hammer resulting in the removal of flakes from both ends of the core and dimple-scars on both anvil and hammerstone. In addition some core reduction resulted in what Mary called *outils écaillés* and punches. This appears to be the earliest evidence for the use of bipolar flaking and so far it remains the earliest record in Africa of the use of this technique and appears to be specially associated with Olduvai. The results of this research in the upper Oldowan sequence is reported by Mary in the last Olduvai volume, Volume 5, which provides also statistical analysis on biface form and a comparative study of the Acheulian assemblages by Derek Roe, and Paul Callow, as well as Peter Jones's study of the technology and the sources of the raw materials. This volume also contains a most interesting and intriguing record by Mary of the excavation of 'pits' and 'channels' in a hardened surface at JKIII. Using ethnographic analogy, Mary suggests these are solution basins and channels leading the minerally charged waters where, after evaporation, the mineral salts remain. The similarities to the ethnographic method of obtaining salt in north Kenya are certainly impressive. This is another volume that preserves the invaluable hard data that Mary and her co-workers so painstakingly recovered. Apart from the JK pits Mary made little or no attempt to provide interpretation of the respective assemblages and as usual left this to subsequent researchers to extract hypotheses from her hard data.

Louis died of a massive heart attack in London in 1972 on his way to another lecture tour in the United States. His visits to Mary to see the progress on the upper series of Beds were less frequent after 1968 in view of his involvement with lecture tours, but he and Mary met at the Langata home on her visits there and they enjoyed two visits to Ethiopia, one to receive the Heile Selassie prize for scientific research and the other in 1971 for the Seventh Pan African Congress at which they were both

honoured. They last met at Langata with Richard just back from east Turkana with the famous *Homo habilis* cranium ER1470 with which they were greatly impressed.

Mary returned to the Olduvai camp in October 1972 and the next ten years, with the support of the National Geographic Society and the Leakey Foundation, were spent completing the excavation and recording the upper part of the sequence, Beds III, IV, and its contained lithic assemblages and she was ready to prepare the detailed report (*Olduvai Gorge Volume 5*) on the work and the resulting analysis of the finds.

With her own text for the monograph completed Mary awaited various specialist reports by colleagues overseas and turned her attention to the Laetoli deposits and the discovery of a new area of undisturbed sediments, including a single hominid tooth. Volcanic tuffs deposited by the now extinct volcano, Mount Olmoto, enabled Dick Hay to show that the Laetoli find was from a time earlier than the base of the Olduvai sequence, which was 1.9–2.0 million years old. Further search of exposures of the Laetoli Beds resulted in the recovery of a number of hominid remains; a mandible, maxilla, and post-cranial bones. Garniss Curtis dated a lava capping to 2.4 million years making the underlying sediments with fossils still older. This produced excitement and a full investigation was called for and carried out with National Geographic Society funding for three months in 1975. Although Mary had a large team of specialists and other helpers working with her at Laetoli, the logistics were more difficult than at Olduvai. Transportation and supplies were not easily brought to the camp of grass ‘bandas’ and tents, but the work continued until the 1980s. Richard Hay’s five season’s work on the geology established the stratigraphic sequence showing that the Laetoli Beds contained no stone artefacts which appear only later in other formations, not surprising since the upper part of the bed was dated to nearly 3.5 million years BP. The volcanic components of the Laetoli Beds are aeolian from the volcano Sandiman to the east and they consisted of volcanic ash and tuffs, amongst which are some tuffs that are directly air-borne tuffs. In one of these layers was found the most remarkable discovery of all, the ‘Footprint Tuff’, with very many impressions of the feet of animals of all kinds, including large mammals, reptiles, birds, and insects that had passed over the carbonate tuff as it was being hardened by rain as these creatures walked or crawled across it. These footprints were perfectly preserved and first identified as such by Paul Abel a geologist. In another of these hardened surfaces Mary and her team of workers found the unique trail of hominid footprints identified as those of two individuals walking

side by side and the wider and deeper impression of one suggest there was a third individual walking in these footprints. This was immensely exciting as this confirmed, without a shadow of a doubt, the fully bipedal walking gait of these hominids at this time.

Dr T. D. White was invited to describe the fossil hominid remains and provided a full report. Later, while examining and describing the rich hominid remains from the Hadar site in the Ethiopian Rift, he and Johanson recognised the similarity with the Laetoli fossils and so these were included with the Hadar fossils as *Australopithecus afarensis*. Mary was unhappy about this because she thought the variability she saw in the Ethiopian fossils would likely represent more than one species and would probably have used a different species name.

The Laetoli footprints and fossils are without equal in confirming Australopithecine bipedality and that of other Homo species. Much has subsequently been written about these footprints and the full trail was cast in latex for subsequent study by specialists. The trail was buried at the close of the Laetoli program and was covered for protection with sand and lava boulders. The ensuing years resulted in Acacia trees growing over the footprints and so the Getty Conservation Institute was invited by the Tanzanian Antiquities Service to examine the site and make proposals for its future preservation. This resulted in the decision to preserve the footprint trail in situ and this was carried out by one of the Getty Conservation units. The earlier covering was removed, the surface cleaned and a series of preserving layers laid down to inhibit further plant growth. Mary visited Laetoli three months before she died taking a great interest in the finished work and was pleased with the interest shown by the Masai tribe, including its chief shaman, who undertook to oversee the protection of this unique and precious monument of our ancestral tree.

During these Laetoli years Mary made regular visits to England and the United States lecturing and raising funds for the continuing work. These visits proved exhausting but very necessary and very rewarding, and Mary in her last few years made several visits to the Leakey Foundation in San Francisco and regularly attended its annual meetings and was appointed a trustee and its representative in East Africa.

Between 1968 and 1985 Mary divided her time between the camp at Olduvai and Langata, driving the full distance in a day. When the border between Kenya and Tanzania was closed she was able to be close to her family in Nairobi. She wrote the volume on the Laetoli research and finished that on the upper part of the Olduvai sequence. She was able to complete the volume on the Kisesse rock paintings, and still often made

visits and lecture tours to Europe and the United States. In 1982 she suffered a thrombosis and was no longer able to see out of her left eye, but she overcame this to the extent that she was able to draw stone artefacts again. Continuing to live at Olduvai became increasingly more difficult due to the politics, and scarcity of resources and fuel for the vehicles. It took her twelve hours driving to get back to Langata when the borders opened again and when petrol was once more available. It had become time to move back to Kenya and since so many of her neighbours had left, she did not find it the heart-breaking wrench she had expected. Her remaining years were spent writing, lecturing, attending conferences, and travelling to receive the high recognition she was accorded by the academic and scientific community, and the admiration of the general public who attended her lectures in large numbers. She was elected to a Fellowship of the British Academy in 1973. The visits to her friends in California and England pleased her greatly.

Mary died at the Langata home in her sleep on the night of 11 December 1996 aged 83 and her whole family had come to be with her, her three sons and their wives and grandchildren. Mary was greatly attached to her family, a loving and supportive mother and she is held in very great affection by them all, as is well seen from her autobiography *Discovering the Past* (1984). With her death the great era of pioneering research on the evolution of our biological and cultural beginnings came to an end. It was an exhilarating, exciting six decades during which the data were recovered—slowly at first and then when the significance of the record preserved in Africa became recognised, increasingly more rapidly. The Rift Valley and related rift systems, yielding the many discoveries made possible by financial support for large scale surveys, excavations, and publications of the hominid fossils and associated data with their behavioural implications, led to new intellectual horizons and systematic uses of new methods for recovering evidence of habitats and the associated plant and animal components.

This review of Mary Leakey's life emphasises the great debt all palaeoanthropologists, anatomists, and others working on early human origins owe to her. Louis and Mary's discoveries were made at a time when the scientific community was receptive of the direct fossil remains demonstrating the great antiquity of the hominid lineage. They were also working in the richest region of the Old World where this evidence is preserved. But it is their perseverance that first began to produce this evidence. As mentioned earlier, Louis often joked of 'Leakey's Luck' and indeed this could have been a factor, but the most significant part of the

'luck' was Mary. Louis was full of energy, charisma, and innovative planning, but it was Mary who produced the data as a result of her meticulous methods of excavation and recording work in the field. That this memoir stresses her work at Olduvai Gorge is intentional for the standard she set there for fieldwork on the Palaeolithic today, and it was here the major hominid fossils and cultural associations were made. Searching, finding, and uncovering the evidence and the arduous hours and days in the field reconstructing the hominid fossils and analysing the associated archaeology that are the clues to recognising the societies and economies of early hominid populations.

Mary was a tireless worker with long days and long hours on the excavation or in the laboratory and expected her helpers, of whom she had many, to do the same. That she was able to keep her diverse team members hardworking and content says much for her organisational ability and the respect she received from all who knew and worked with her. She was kindly, but rigorously pursued her objectives, which were mostly achieved with resulting success.

Olduvai Gorge, Volumes 3 and 5 are reports par excellence of many years devoted research that provide, for all time, the details of the archaeological residues in their context upon which the behavioural constructs of early hominid life-ways can be built. Never before had so much data become available for each of the many occurrences at a Palaeolithic site. Mary herself, did not mix up or confuse hard data with behavioural interpretations. The meaning of her data she left mostly to others to interpret and there has been no lack of those who are recovering a wealth of behavioural evidence from Mary's reports and the assemblages themselves as new ways of extracting information from these archaeological residues and their context became available. For instance, at a time when 'unidentifiable' bone fragments would normally have been thrown away, Mary collected everything and as a result, refitting studies have shown the significance of long-bone marrow for early hominid diet and so also a lot about hunting and/or scavenging habits. Hypotheses and models come and go as understanding is expanded, but the hard data are there for all time and are, therefore, all-important. There are already many possibilities for their use with many more to come. For example, a major incentive to Glynn Isaac's development of the study of 'landscape archaeology' was surely the environmental constructs of 'Dick' Hay for Olduvai in conjunction with Mary's evidence for the changing geography of the archaeological sites through time. So the landscape archaeological concepts and methods are now being applied to Olduvai itself.

Discussions with Mary and Louis in their home, at meetings or in the field, were always greatly stimulating, indeed exhilarating and exciting. When you did not agree it could be difficult, especially with Louis, but Mary always retained an open mind to the end. The decades at Olduvai and Rusinga were the greatest partnership of palaeoanthropologists of the century and will not be forgotten. Their personalities were so different, Louis's exuberant and outgoing, Mary quiet with infinite patience and attention to detail: the combination and mutual compatibility was their success. Their life and work together is an unequalled saga in the field of prehistory. Their autobiographical books show what it meant to be a pioneer prehistorian in Africa: something of the excitement, the frustration, the disappointment and also the fulfilment of an undertaking well discharged. Their lives speak of the determination that stems from the confidence in their belief that they would find what they were looking for and radiate the great enjoyment of the search and the greater satisfaction of the reward. Like that of Louis, Mary's contribution to the advancement of palaeoanthropology and prehistoric research is unique. It represents a milestone in the pursuit of the clues to our ancestral origins and cultural advancement. The remarkable Leakey family—Louis and Mary, Richard and wife Meave and brothers Jonathan and Phillip—has added immeasurably to the circumstantial knowledge of the ancestral tree, and they have our abiding respect and admiration for the way they have shown researchers the way to overcome the difficulties and complications of interpretation. They have been the pathfinders whose achievements are an inspiration and a challenge to those who follow on today and in the continuing work of increasing the clarity and precision of the record of our human past. Mary's friends will always remember her with much affection, surrounded by her Dalmatians and her liking for good scotch and cigarillos, which kept her company to the end. The grass and woodlands of Africa were her love and she remains an endearing figure there still.

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Note. It is a pleasure to acknowledge here the photograph of Mary taken by Vic Cox in the 1980s. I am grateful also for the help in the preparation of this memoir by the LSB Leakey Foundation.

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