

Confessions of a biologist

Sydney Brenner

A Slot Machine, A Broken Test Tube: An Autobiography. By S.E. Luria. Harper & Row: 1984. Pp.228. \$17.95. To be published in the UK on 31 May, £12.50.

AN autobiography allows a man the opportunity to tell all about his life and work, to reveal his secret motives and ambitions, and to give a personal view of the world and the people he has known in it. For many scientists, total self-revelation might be almost indecent; there is the professional stance of objectivity and rationality and, more to the point, there is that stuffy, critical audience of colleagues. Scientists are second only to politicians in taking themselves very seriously and in erecting deeply boring literary monuments to themselves. Perhaps only the old and very accomplished, who no longer care what people think of them, and, possibly, the slightly mad, who don't mind, can write provokingly about themselves. The reason why Jim Watson's *The Double Helix* is a marvellous book is not that it demystified the historical process of the scientific endeavour, as has been said, but rather that it tempered the drama with high comedy and, at the end, the person who emerged as the worst (as well as the best) was the author himself.

Salvador Luria, Sedgwick Professor of Biology at the Massachusetts Institute of Technology, would agree with most of this, and he sets the challenge in the preface: "I have found most biographies of scientists remarkably uninteresting and their autobiographies even more so". The book he has written is deliberately personal — a confessional account of himself and his scientific, political, literary and other interests. The treatment is not chronological and the author explains that he is replacing this by a developmental approach which he sees in existential terms, the self defining itself by creative acts of will in response to the outside world. Indeed, in the preface the reader will find a theory not only of life but also of meta-life, or autobiography.

However, the most interesting part of the book is the story of Luria's early years. He was born in 1912 in Turin, Italy, into a branch of one of the oldest Jewish families. A contemporary at school was Ugo Fano who later became a physicist and played an important role in Luria's life in giving him Max Delbrück's papers to read; I did not realize that Luria knew of Delbrück before he went to America. Luria studied medicine, spent some time in Rome, left Italy for France in 1938 and escaped to America in 1940. It is a great pity that he devotes only 19 pages of the book to this

period during which Italy and Europe underwent cataclysmic political and social changes. I would have liked to have heard more about this time of his life; given his avowed existentialist views, he should have told us more about the formative years instead of merely flitting through them. Indeed, the remainder of the historical narrative is treated in the same brief manner, and is like an abstract of an autobiography rather than the book itself.

The middle part, "The Science Path", describes his scientific work and development. All elderly molecular geneticists know of the Luria-Delbrück fluctuation experiment which proved that mutants pre-exist in bacterial cultures and do not depend on exposure to the agent used to select them. The experiment consists in measuring the variation of mutant frequency in independent experiments. Luria recounts how he got the idea at a faculty dance at Indiana University in 1943 by watching someone using a slot machine (one reference to the title of this book). The experiment was intended to refute the views of Sir Cyril Hinshelwood who did not believe in genes or mutation but only in chemical equilibria. I happen to know it did not convince him at all, because I spent several months at Oxford in 1952 and 1953 doing enough fluctuation experiments to prove to Sir Cyril that the results could not be explained by dirty test tubes. The broken test tube of the title also refers to another of Luria's experiments which led him to the discovery of the restriction phenomenon, research which has had a great impact.



The remainder of the book is about Luria's interest in literature, especially poetry, his commitment to politics and his emotional development, each considered separately, as examples of his sectorial theory of autobiography.

I found the book disappointing. Although not a contemporary, I know many of the protagonists and have lived through many of the events in science; I also know Luria and over the years have naturally formed my own opinion of him. Perhaps, like writers of autobiographies, reviewers need to be open and divulge their private judgements. There is a sense in

which this book might be even more self-revealing than the author intended. There is the Luria described, but there is also Luria the describer — a man with confident, if somewhat ponderous, judgements on all matters, noisy, irritable, ego-centric. Who else could have written the following after a reference to literature classes he conducted for science students at home?

Some time ago I received a note from a former M.I.T. student who had been in one of my classes. She reminded me that when she had told me she was planning to spend the summer after graduation learning more biochemistry I suggested that instead she read Virginia Woolf. She claims that she did follow my advice, with the result that instead of chemistry she went into business administration. Shadows of Bloomsbury! Maybe she will be another John Maynard Keynes. □

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African ancestors

C.K. Brain

One Life: An Autobiography. By Richard E. Leakey. Michael Joseph: 1984. Pp.207. £10.95.

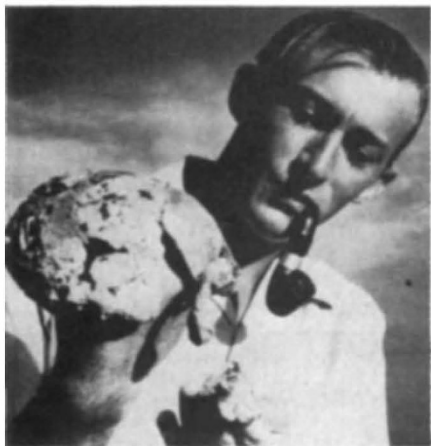
TO HAVE been born into the Leakey family of East Africa meant that, from birth, one was immersed in African antiquity, fossils and discussion of human origins. Understandably enough, Richard Leakey's first reaction was to distance himself from things academic and from the research activities of his illustrious parents, Louis and Mary. But the allure of fossil man drew him back, urging him to make a unique contribution to palaeoanthropology, on his own terms, and free of his father's shadow. How this was achieved is the story of Richard Leakey's life, related here with freshness and excitement which makes most enjoyable reading.

The road to personal discovery started in 1963 when, at the age of 19, Richard was piloting a light aircraft over the rift valley to Olduvai Gorge. Along the west side of Lake Natron he saw exposures of promising-looking sediments and before long returned to the place to establish that fossils could indeed be found in abundance there. With help from his father's National Geographic Society grant, he organized several expeditions to this Peninj site, accompanied by Glynn Isaac, who was to become codirector of the later Koobi Fora project, and Kamoya Kimeu, who in time established himself as Kenya's foremost fossil-collector. This fieldwork produced a spectacular mandible of *Australopithecus boisei*, the first lower jaw of this hominid to be found in East Africa.

Richard's big chance to exercise his organizational skill came three years later, when a joint American-French-Kenyan expedition involving Clark Howell, Camille Arambourg and Louis Leakey went to the Omo valley in Ethiopia. Louis Leakey dele-

gated his son to act as his representative and as field leader of the Kenyan team, which set off in June 1967. In the course of that expedition, again while travelling by air, Richard came to see the fossiliferous sediments on the eastern side of Lake Turkana that were to prove of such immense significance.

The fossil wealth of the Lake Turkana deposits, subsequently revealed by inspection on the ground, convinced the National Geographic Society that an expedition to the area would be a rewarding enterprise. This expedition, organized and

From *One Life*.

Subjects of controversy — a youthful Richard Leakey with the 1470 skull.

led by Richard, made its headquarters at Allia Bay, and proved fruitful beyond hope — the haul of fossils was so great that each year since 1968 there has been scientific work in the area and a permanent establishment is based there.

On the second expedition of 1969 the base camp was moved to a sandy peninsula ten miles upshore known as Koobi Fora. On this expedition the young geologist, Kay Behrensmeyer, was the first to find very early stone artefacts weathering from a deposit of volcanic ash, or tuff, which could be dated. This volcanic horizon, known as the Kay Behrensmeyer Site (KBS) tuff, became the centre of a dating controversy, crucially affecting the interpretation of the fossil hominids shortly to be found at Koobi Fora. The first of these specimens, found in July 1969, was a particularly beautiful skull of a robust australopithecine. Further discoveries followed but the most significant was the 1470 skull found in July 1972 by the Kenyan, Bernard Ngeneo. This was clearly not the skull of an australopithecine: its cranial capacity was about 775 ml and, on the initial dating of the KBS tuff, it was thought to be more than 2.6 million years old. The announcement of 1470 and Richard's interpretation of it as belonging to *Homo* of such great antiquity sparked a lively controversy. It was the palaeontologist Basil Cooke who showed in 1975 that, on the evidence of fossil pigs from Koobi Fora, the KBS tuff could not be as old as first thought. Revised dating estimates put the age of the controversial 1470 skull at about 1.9 million years, where

its advanced features can be accommodated with greater confidence.

Perhaps the most striking feature of the personality portrayed in this autobiography is the driving ambition and energy behind the achievements, sharpened perhaps by the realization that Richard's life could well be a short one. In 1969, aged 25, doctors told him that his kidneys could not last more than ten years, and by 1979 his health had severely deteriorated. The situation was saved by the transplant of a kidney donated by his younger brother Phillip — this was the end of "one life", the title of the book, and beginning of another.

One of Richard's ambitions was to become Executive Director of Kenya's National Museum. But how to do it at the age of 23 and without the benefit of university training? His strategy was based on the observation that government support for the museum was low and that there was dissatisfaction with the fact that Kenyan nationals were not being trained for senior positions. Richard set about raising money, establishing an organization known as the Kenya Museum Associates with its own board of directors, which included prominent Kenyan personalities, and a formal constitution. By virtue of his position as Director of the Kenya Museum Associates, Richard attended museum board meetings and became active in the museum's administration.

The next step was to persuade a high-placed civil servant to give the board an ultimatum: either it took on Richard Leakey and made efforts to Kenyanize senior posts or else all government funding would cease! Apprehensively the museum board offered Richard a post of Administrative Officer; but rather than accept it, he insisted that it be upgraded to Administrative Director with full responsibility for the administration for the entire National Museum. The board seemed to know when it was beaten and agreed to the demand, allowing Richard to take up the post from October 1968.

This *coup d'état* approach to problems in one's life may be effective, but it tends to generate conflict and animosity. Richard was well aware of such effects, regarding them as unfortunate but unavoidable by-products of one's passage through a peopled world. Such matters aside, the life described in this autobiography is one of exuberant excitement and adventure. It tells of catching lions in the suburbs of Nairobi as a schoolboy; of narrow escapes from hungry crocodiles on the Omo River; of riding camels in search of fossils at Koobi Fora; and of finding spectacular skulls of immense interest to world science. More than this, the book illuminates a personality that has become known to millions through television programmes such as *The Making of Mankind*. □

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Measured moments

Barry Cox

Timescale: An Atlas of the Fourth

Dimension. By Nigel Calder.

Chatto & Windus/Viking: 1984. Pp.288.
£12.95, \$19.95.

NIGEL Calder's unusual book provides a complete chronology of the world, starting with the first microsecond some 13,500 million years ago, and ending with the Space Shuttle.

It would obviously have been impossibly dull to do this only as a consecutive narrative, and Calder has sensibly taken several different but complementary approaches. The main section of the book (nearly 100 pages) is taken up by the "Narrative and Timescale". Because both the extent of our knowledge and the intensity of our interest steadily increase through time, Calder uses a logarithmic scale. So, after mention of the first million years that encompassed the birth of the Universe, each double-page spread deals with progressively smaller bites from the cake of time, starting with 3,500 million years and passing through 6,000 years to end with the past eight years. (But the author has not allowed himself to become the slave of this format, for the text runs continuously from spread to spread.)

Though the narrative that accompanies this roller-coaster ride through history is always clear and coherent, it can inevitably make only passing reference to many significant events. Calder has therefore added a reference index, about 100 pages long, in which topics are elaborated or added. This includes over 900 entries, most of which are given dates for their origin or extent in time, and are cross-referenced — e.g. blue-green algae (bacteria) est. 1600 Myr, *see* life on Earth; stromatolites. The entries range in length from one line to three pages, and many provide useful references for further reading.

Calder's third approach is to give eight pages of maps, which show the various stages of continental drift, the climate and geography of the Ice Age maximum, and the dispersal patterns of the races, languages and techniques of mankind.

In the sixty-page introductory "Overview", Calder puts the whole chronological enterprise into the historical perspective of its discovery. This, too, is written in a stimulating and provocative style — for example, he suggests that the master of the planet is grass, which has seduced its human slaves into cultivating, protecting and feeding it. We are, then, the puppets not only of our selfish genes, but also of our selfish grains. Calder's book is both enjoyable and useful — not a common combination. □

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