one new hominid taxon, *Australopithecus boisei*, but two, the second being *Homo habilis*. Louis and Mary Leakey had already retained the anatomical advice and services of Professor Phillip Tobias to help them interpret OH5, and to describe and analyse it in detail. When the possible importance of the subsequent discoveries was appreciated, Tobias's brief was extended to studying the skulls and teeth of what was to constitute the latest new taxon. The Leakeys' faith in the scientific talents of 'PVT', as he is widely known, was amply justified. His monograph on the OH5 cranium was a seminal work in palaeoanthropology. It set new standards for the analysis of morphological detail, and many of the phylogenetic interpretations it espoused proved to be durable and influential. Now, nearly a quarter of a century later, the same incomparable anatomical talents have been turned towards the task of describing and analysing the items that make up the collection of *Homo habilis* cranial remains from Olduvai.

It is surely appropriate, and not hyperbole, to use the term *magnum opus* to refer to this work. The sole authorship by Tobias of more than 900 pages, arranged in two tomes and weighing 5.2 kilograms, is a formidable achievement. His text begins with a summary of the history of ideas about *Homo habilis*. He chronicles the initial scepticism of colleagues and then, with justifiable satisfaction, goes on to record recent evidence that the hominine status of *Homo habilis* is now widely, if not universally, accepted. Important specimens are dealt with in order of completeness, beginning with the cranium OH24, then turning to OH13, OH16 and OH7. These cranial remains, together with the mandible OH37, and several sets of isolated teeth, dental and calvarial fragments, comprise the 19 specimens that Tobias considers in the volume.

The level of morphological detail corresponds to that in Tobias's previous volume in this series, but in this case the structure of the work, which deals with an apparently homogeneous collection specimen-by-specimen instead of region-by-region, does make the monograph unwieldy, both literally and metaphorically. For example, the reader needs to concentrate hard to locate the whereabouts of reviews of the remains attributed to each tooth type. Tables of measurements occur throughout the text, placing an additional, and probably unnecessary, strain on both the patience and the wrists of the reader.

We have come to expect a high standard of accuracy from the author, but the fact that he achieves, and maintains, that standard throughout is remarkable nonetheless. The upper limit of the cranial capacity of *Homo habilis* is incorrectly quoted; but in general, factual infelicities are commendably rare. The unwary may be confused by the term 'gens'. It reads as if it may have been the result of a well-intentioned, but disastrous, spell-check procedure for genus, but Tobias explains that he uses this little-used label to denote a phyletic lineage. Aside from the detailed analysis of the preserved morphology, the text includes useful contextual information about both site localities and the location of residual distortion in specimens such as OH24. Tobias's warning that the basibregmatic and supraorbital heights of this specimen are underestimates, and Clarke's caution, set out in the second of the appendices, that its cranial capacity in the undistorted state "must inevitably be greater than the absolute capacity as measured now" (page 858), should be heeded by those workers who seek to interpret the affinities of this important specimen.

As fine a work of scholarship as this is, it is unlikely to be the last word on *Homo habilis*. Comparisons with relevant remains found elsewhere in Africa are relatively few and developments since 1985 are largely unreported. Tobias's analytical methods are traditional, and his approach is statistically relatively unsophisticated. But his meticulous documentation of the morphological evidence is sufficient reason for this latest monograph to become the definitive and enduring record of the important fossil hominids from Olduvai Gorge. The case for Tobias to be numbered among the masters of palaeoanthropology was already a strong one, but with the publication of these volumes, his place in their midst is assured. □

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Bridging the quantum gap

L. Eaves

Quantum Semiconductor Structures: Fundamentals and Applications. By Claude Weisbuch and Borge Vinter. *Academic: 1991. Pp.252. $34.95, £25.*

THE physics of quantum semiconductor structures is now one of the most lively areas of condensed-matter research. The quantum Hall effect, where the Hall resistivity changes in steps of h/e^2, is perhaps the best-known property of such devices, as its discovery led to Klaus von Klitzing's Nobel prize and to a new international standard of electrical resistance. In addition, the devices made from quantum semiconductor structures have entered many homes in the form of semiconductor lasers to read the music on compact discs and fast transistors at the front end of instruments to receive satellite broadcasting. Although much of the underlying physics is fairly straightforward, there has been a notable and frustrating absence of any text providing a general but thorough introduction to the field. This excellent new book admirably fills the gap, no doubt in part due to the fact that its authors work at one of the leading European laboratories for research and development of semiconductor devices, Thompson CSF in Paris.

The quantum structures described fall into two main categories. In the first, the electrons are constrained to move in a plane ('two-dimensional electrons'). By depositing the dopant atoms well away from this plane, the motion of the electrons is unimpeded by scattering from these impurities. This results in long electronic mean-free paths when the structures are cooled to liquid-helium temperatures. Under these conditions, and especially when a magnetic field is applied, the electrical resistance of the structures is dominated by the quantum-mechanical behaviour of the conduction electrons.

In the second type of device, the electronic states and optical properties are governed by the electronic motion and quantum tunnelling in the direction perpendicular to the layered planes of a semiconductor heterostructure — essentially a multiple sandwich structure composed of layers of different semiconducting materials. The authors give a clear and detailed account of quantum wells, resonant tunnelling devices and superlattices, and of how these can be used to make new types of electronic and optoelectronic devices such as quantum-well lasers, optical modulators and very-high-frequency devices.

The text is well illustrated by many figures and diagrams. It will be essential reading for postgraduate research students entering this field and also for those studying university courses in physics and electronic engineering. Experienced researchers will also find many of the explanations illuminating and the bibliography an excellent source of references. □

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New Journals

Appearing in next week's issue is *Nature*'s New Journals supplement, in which more than 50 journals are to be reviewed.