

still greater interest) are presented without the citation of references or sources.

Many of the chapters are brief in the extreme. The first three, dealing with evolution, taxonomy, and Cenozoic geology, are only two pages each. Some of the others are equally short. Obviously the level of discussion is that of superficial generalization. Clearly the best chapters are those dealing with living primates and pre-Pleistocene fossil primates, a focus reflecting Tattersall's indebtedness to Elwyn Simons, David Pilbeam, and the Yale milieu. These chapters display the greatest accuracy and sophistication (although the species name of the original *Dryopithecus fontani* is misspelled on p. 31).

From the beginning of the Pleistocene, the treatment gets less sure as the time level advances towards the present, and the number of errors both of omission and commission increases. The vertebral column, pelvis, and femur "known from Swartkrans" (p. 42) is actually from Sterkfontein as it is so labeled in the picture on p. 43. The claimed curvature of the Australopithecine ilia behind the acetabulum is doubtful, Steinheim was not found in 1935, the face and jaw of the Solo finds and the jaw of the Rhodesian specimen should be labeled as hypothetical. The tentative acceptance of a 60,000 year age for the undatable Kanjera material while ignoring the dated Florisbad skull is a questionable procedure. The impression that fossils of thirty thousand years of age are indistinguishable from modern men is most misleading, and the claim that "the economic basis of their society was essentially unchanged from that of hominids millions of years earlier" is an inexcusable display of ignorance.

Physical Anthropology: An Introduction. A. J. KELSO. New York & Toronto: J. B. Lippincott, 1970. xxii + 355 pp., figures, illustrations, maps, tables, chapter bibliographies and recommended reading, glossary, index. \$8.95 (cloth).

Reviewed by MILFORD WOLPOFF
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Kelso has written one of the best organized freshman-sophomore level intro-

ductions to physical anthropology available. The book is well balanced and unusually complete, ranging from the history and background of physical anthropology through evolution and genetics, primate and human paleontology, and finally human variation and ongoing evolution. For the final topic he utilizes the phrase "human heterography." I find his discussion of human heterography particularly useful for classroom assignment. He divides traits into those of known and unknown inheritance, making the corresponding differences in adaptive function conspicuous.

His comments, as a whole, act to compare and contrast a number of conflicting viewpoints. Each section ends with a minimum summary of the undisputed conclusions rendered from such comparisons. The constant use of an evolutionary interpretive framework lends an organization particularly suited to a textual presentation.

The figures and tables are numerous and usually integrated with the text. One may question his neglect of twentieth century physical anthropologists in the history section, and the substitution of lengthy and not always clear explanations of population genetics phenomena when a simple discussion of the (often absent) formula would suffice, but these are not major criticisms.

Unfortunately, the generally positive impression is marred by the numerous and inexcusable errors of fact. For instance, the chimpanzee in Figure 6-1 described as having a sagittal crest (p. 171) does not. The lateral views comparing human crania, such as in Figure 6-2, do not place all specimens in the Frankfurt Horizontal. Skhul and Tabun are not "temperate interglacial" specimens (p. 185 and Table 6-4), and one wonders how it could have been glacial in Europe and interglacial in the Near East at the same time (Table 6-4). The hand-axe and non-hand-axe Mousterian sites are not necessarily geographically separated (p. 186). Vertessollos was not included in the presumably complete list of *Homo erectus* specimens in Table 6-5. The actual range of Neanderthal cranial capacities is at least 600 cc. greater than that indicated on p. 195. Taurodontism is not synonymous with fused molar roots (p. 195). There is no date for the lowest levels of Bed II at Olduvai gorge (p. 207). Steinheim was apparently forgotten (p.

210). The cranial capacity of Olduvai hominid 5 is not between 600-700 cc., and so on.

What is probably the most misleading error occurs in Figure 6-20. In this comparison of gracile and robust Australopithecines with modern man, a non-existent specimen is illustrated. The gracile Australopithecine shown is a cast (Philadelphia Museum Number 712) of a reconstruction of MLD (Makapansgat) 1 and 6. When this reconstruction was made no other Australopithecine occipitals were available. With the unearthing of other occipitals, it became apparent that Dart's reconstruction of MLD 1/6 was incorrect. The angle of the occipital with the horizontal is far too great in the reconstruction, resulting in a calvarium too high and consequently too long. Thus, the reconstructed cranial capacity is double that of the Australopithecine average. In addition, the occipital fragment evinces temporal lines so close together at lambda that the specimen, if complete, would surely have had a sagittal crest. In other words, the specimen Kelso chose to represent gracile Australopithecines was reconstructed with a cranium with twice the volume the original probably had, and without the sagittal crest that is indicated by the occipital morphology. This leads to an *extremely misleading* comparison of gracile and robust australopithecines.

As a whole, the skillful and generally accurate summaries of the material do not rest upon these errors. Rather, they serve as a needless diversion from an otherwise excellent text.

Laboratory Exercises in Physical Anthropology. RONALD K. WETHERINGTON. Springfield, IL: Charles C. Thomas, 1970. ix + 95 pp., charts, figures, tables, list of materials and comment, glossary. n.p. (paper).

Reviewed by AUDREY SUBLETT
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Wetherington has attempted a new version of an old subject, that is, an up to date laboratory manual for teaching physical anthropology. He maintains that "the manual has been modified to accommodate

shorter or longer sessions by dividing exercises into distinct parts. With this added flexibility, parts of laboratory exercises may be omitted and others expanded." It is obvious that all sections should be expanded. It is implicit that the instructor is expected to fill in and amplify with a great deal of additional information.

The fourteen exercises are varied and range from Mendelian genetics through anthropometry to fossil man. Of the first five sections (Cell Division and Mendelian Genetics, Genotype and Phenotype Analysis I and II, Biochemical Variation and Natural Selection, and the Molecular Basis of Heredity) the variation section is the best and is perhaps the most integrated one in the entire manual. It involves an extensive laboratory procedure (electrophoresis) and a barrage of concepts. For the most part, however, actual student performance depends on mimicry rather than a systematic application of integrated concepts. Generally, the exercises are of such an elementary nature that they contribute little to an understanding of the subject matter.

Sections 6 through 11 (Bone Growth and Skeletal Age, Anthropometry of the Living, the Dead Skull and Postcranial Human Dentition, and Estimation of Sex and Age) are very metrically oriented and most standard measurements are covered. However, there are some discrepancies in the morphological discussion (glenoid fossae used for mandibular fossae; supraorbital torus used synonymously with supraorbital ridge). The attritional rating scale on p. 65 is not one generally used and the implications for interpreting subsistence patterns are ignored.

Exercise 12 considers the primates (Studies of Contemporary Primates) while 13 and 14 deal with Fossil Man (the Australopithecines; Middle and Late Pleistocene hominids). They are naturally concerned with typology in problems of classification. Students are directed toward morphological and, primarily, metrical evaluations for making classificatory distinctions.

The only other equatable text in a broad based sense is Kelso and Ewing's 1962 Introduction to Physical Anthropology Laboratory Manual. Wetherington's Manual is predicated on a fourteen week program