



## COMMENTARY

THE *TRAITÉ DE ZOOLOGIE*  
AND THE PLEASURE OF POSSESSION

A consideration of the series, *Traité de Zoologie*. Pierre-Paul Grassé, Series Editor; particular attention is paid to *Tome XVI, Fascicule 1 (The Integument, The Skeleton)*, 1967; *Fascicule 2 (The Musculature)*, 1968; and *Fascicule 3 (The Musculature, The Joints)*, 1971. Masson et Cie., Paris and New York.

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DURING THE 1950s and 1960s American zoologists began to learn about two series of monographs, enormous in sweep and intimidating in cost, published by Masson et Cie., Paris. They were, of course, the *Traité de Paléontologie* and the *Traité de Zoologie*, and graduate students with stipends of \$1800 a year did not even joke about owning them. One of my peers, however, with extra money coming in from the Naval Reserve and upon the strong recommendation of one of our professors, ordered the *Paléontologie* volume (sic) from Blackwell's. In due course and to his horror, an enormous crate arrived with some 10 volumes and a bill for more than \$1,000.00. He sent them all back, including the one volume he had wanted, thinking, perhaps rightly, how difficult it would be to explain his error. The *Traité de Zoologie* was even more vast: a projected 17 volumes with 20 fascicules (or parts)—3 fascicules in Volume V to cover the annelid worms and molluscs, 4 volumes to cover the arthropods, 6 volumes in multiple parts to cover the vertebrates [see, for example, reviews in the *Q.R.B.*, 31:306 (1956); 45:100 (1970); 47:106 (1972)]. The sections I saw averaged more than 800 pages per fascicule and cost roughly \$100.00 apiece. Ultimately, the number of fascicules rose above 35, and the average number of pages above 1000! For mammalogists,

interest grew from the middle 1960s because Volume XVI, in seven fascicules, would "treat" anatomy (skin, skeleton, joints, the musculature, the nervous system, the gastrointestinal tract, the circulatory system, reproduction, and embryology); and Volume XVII, in two fascicules, would "treat" systematics and ethology.

By the middle 1960s I was working with prosimians and initiated correspondence with F.K. Jouffroy, a young French anatomist, who had recently published her dissertation on lemurs. Subsequently, en route to Madagascar, I went to Paris and met Françoise Jouffroy and Jacques Lessertisseur, her colleague, at the National Museum of Natural History. They had begun their contributions to the *Traité* on the skeletal, muscular, and functional anatomy of mammals, which dominate the three fascicules I am about to discuss. I don't recall that Françoise or Jacques indicated (or perhaps realized?) the enormity of their undertaking (they wrote some 1660 of the 3240 pages). Nor did I understand that these contributions would not "count" towards promotion. They still had to publish their research, give papers at conferences, and so forth. I had also assumed that their research had come first, and that the experience had given them perspective for the overview. In any event, a few years

later, when the sections on the skeleton and the musculature appeared, I said to them, "Someday I'd like to review your contributions." Well, no one has EVER accused me of haste! But the question stands: why comment upon books written in French 15 to 20 years ago at a cost of \$150 to \$200/per part. Read on. . . .

Fascicule 1 covers the integument (over 200 pages) and the skeleton, including cranium, axial skeleton, and limbs (over 800 pages). The contributors, Lessertisseur, Gabe, Gasc, Saban, and Starck cumulatively cite over 60 pages of bibliographic material. The fascicule covers classic problems of evolutionary biology: the relation of brain to body weight; the evolution of the cranial nerves; the evolution of the mandible; skull form and neoteny; and the arboreal and terrestrial origins of the mammals. Of course, these problems have been refined and somewhat recast since then, but as one reads, one is in touch with fine summaries from original sources. Comparative anatomy rediscovers its vital multi-language, multi-cultural tradition: Vicq d'Azyr and Blainville; Vrolik, Böker, Lucae, Carlsson; Slijper, who stands alone; Owen, Huxley; the Italians and the Spanish; the Russians; the Japanese. A citation from Pouchet (1874) illustrates a musculoskeletal mechanism in the giant anteater I had once observed in a dissection, but had never before found in the literature. Now that I work with the Macropodidae, I find a disconcerting number of references to rat kangaroos, tree-climbing kangaroos, and the wallabies "lost" to current bibliographies, losses which I attribute to time, language, bias, and the casual haste of modern science.

The musculature is covered in extraordinary range and depth (1400 pages) in Fascicules 2 (published in 1968) and 3 (published in 1971). The monotremes are given singular treatment; the joints occupy nearly 300 pages. The cumulative bibliography is more than 180 pages. For these sections the authors are Lessertisseur and Jouffroy, Saban, Souteyrand-Boulangier, Gaspard.

The three fascicules provide more than 2300 text illustrations: photographs of dissections—classics, such as Raven's of the gorilla; photomicrographs of embryonic cell migration; a reproduction from Carlo Ruini's (1599) monograph on the horse, cross-sections through tongues; sternal variants in 13 genera, the first

cervical vertebra in 20 others; on facing pages the superficial limb musculature of a lizard and a bison. Description proceeds muscle by muscle: variants are noted by size, change of attachment, adaptive function. About 1600 Latin names of the muscles are listed in the indexes of Fascicules 2 and 3. Within the muscular and skeletal sections "functional anatomy" captures integrated adaptations among tissue complexes of skin, the joints, the skeleton, and various muscle groups.

The textual depth is both rich and unexpected. While I was lecturing on the human shoulder to medical students, I discussed the isolation of the tendon of the long head of the biceps within the glenohumeral joint. This is a developmental phenomenon, important in understanding and treating bursitis. One can imagine my surprise in discovering in *Traité de Zoologie* a diagram that was identical to the one I used in class (and probably the source for it), but the citation was dated 1878, the researcher was Welcker, and the species was *Phoca* (the harbor seal). Thus, we forget (and rediscover!) our "roots." On a given page of these fascicules there may be references to 15 genera from 8 orders of mammals, certainly a challenge to the specialty confines of primate and human anatomist, domestic animal anatomist, or the ungulate biologist.

Writers of scientific English need to be reminded of the color and grace of other languages. The explosive character of jumping in kangaroos and jerboas is described as "paroxystique," the usual insertion of tibialis anterior is "banale," the relations of the back extensor muscles around the anticlinal vertebra are described as a "confusion," and another anatomical term is judged "equivocal" but "consecrated" by usage.

There is a subtle problem with the index. Page citations may be in boldface, regular, or italic type: boldface where the muscle is being described, regular type where it is only mentioned, italic where it is illustrated. (This difference in typeface also applies to species listing: bold where it is described, regular where it is only mentioned, italic where it is illustrated.)

There are minor problems for English-speakers as the muscles are sometimes given French colloquial rather than Nomina Anatomica names—Great Dorsal equals Latissi-

mus Dorsi, Grand Rond equals Teres Major, but these can also be traced through the index. Muscles are described as accurately as possible under "headings" which come from the N.A., but in any case, they are internally cross-referenced so that one can track them down. The very few misspellings are due more to accent than to typography: an English title in the bibliography is written "fonctional" rather than functional, an author is named "Fennstein" rather than Feinstein.

Why review these books now? Why buy them? I purchased my own copies recently out of persistent need and frustration. (Just how long could I go without *owning* the encyclopedia?) In Washington my access to them was constrained by two locked doors, was virtually "by appointment only," and was under circumstances not conducive to ease and concentration: a book of three kilograms, balanced on one's lap along with note pad and dictionary. Furthermore, over the years my research has shifted from primates to a great range of mammals, and these books have become more essential as the only authentic summary of anatomy that I know. W. Krüger's and Benno Kummer's contributions to the *Handbuch der Zoologie* are great resources, but are not detailed enough.

And this is how I use the *Traité*: when I have gotten pretty far along with my research and background reading, I go to the table of contents and make a list of all the page citations for family and genus or genera. I translate the relevant sections and scan the bibliographies to see what I have missed: a Swedish source from the 1880s, a German reference from the 1930s. When I track down those sources, I am done. The *Traité* is my court of last resort.

To designate a book as a "classic" is to be trite; academic classics are fashionable, like automobiles, hats, and bathing suits—regularly

they are announced and regularly they disappear. But these books *won't* go away. I needed them 15 years ago . . . and grumpily survived with library copies. Now I possess them and proclaim myself delighted. They are the "high ground" and the "watershed" for comparative anatomy, because as beneficiaries we need not go through the search and syntheses of the authors; they are books so densely packed that one returns to them again and again. In fact, despite recent market reverses and the declining dollar on overseas money markets, their relative cost has probably declined!

And there is yet another reason to celebrate the series. If one disregards one's past, one loses one's roots; and one will naturally be threatened by one's future. To the scientist posterity equals legacy: who gives what to whom, who owes what to whom, becomes melded in the continuity and advance of scientific thought.

Pierre-Paul Grassé, the General Editor of the *Traité*, died in 1985. Since the list of contributing authors to the 17 volumes and 35 fascicules (with 7 or 8 others still in preparation) requires 4 full pages, one is staggered by Grassé's vision, drive, and ability to coordinate topic by topic, author by author, with publisher and publication.

Françoise Jouffroy has become internationally known for her work in primate biology through her X-ray cinematography, EMG studies, and contributions to the biomechanics of locomotion. These books remind us of her extraordinary background in mammalian anatomy.

Jacques Lessertisseur died suddenly in the summer of 1978—in fact, while Françoise was working at Stony Brook with American colleagues and I was working in Paris and staying in Françoise's flat. Their particular contributions are a monument to their collaboration and a memorial to Jacques.