The write-up concludes with some half dozen citations of original research papers, carefully chosen for quality and relevance. Now all this, you may say, is just "window dressing." How many food purchasers will ever check the references? Few indeed; but that is not the point. The fact that the men from Madison Avenue should use this gimmick implies a greater sophistication on the part of the soft-drink buyer than the editors of a university press will grant to the readers of Dunn's book, which is hardly likely ever to descend to a display rack beside the grocery checking counter. A book of this sort should not have an exhaustive listing of its sources, but a representative sample of the better reviews, monographs, and selected original papers would surely increase its impact on the class of reader to which its content appeals.

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Anatomie de Latimeria Chalumnae. vol. 1, *Squelette, Muscles et Formations de soutien.* 122 pp. (text) + 80 pp. (plates). J. Millot and J. Anthony. Publié avec le concours de L'Institut de Recherche Scientifique de Madagascar, Tananarive, par les Éditions du centre National de la Recherche Scientifique, Paris, 1958.

This sumptuous volume on the skeleton and musculature of the coelacanth *Latimeria chalumnae* is the first of a series by Millot and Anthony on the anatomy of this unique and venerable fish. Ten adult and subadult specimens, including three females, are available for this investigation, which is being carried out at the laboratory of comparative anatomy of the Muséum National d'Histoire Naturelle, Paris.

The details of the skeleton, which are of particular interest to paleontologists, confirm in a striking manner the amazing conservation of this system, which, in most respects, has remained unchanged in the coelacanths since the late Devonian. The partly cartilaginous braincase, divided into separate ethmosphenoid and otico-occipital segments, is nearly identical with the completely ossified neurocranium of the Devonian coelacanths. There is limited motion between the segments, which are held together by ligaments, and ventrally by powerful subcephalic muscles. These muscles work in opposition to the coracomandibularis muscles which elevate the anterior segment through the intervention of the palatoquadrate.

There is also a close and unquestionably significant resemblance to the well ossified rhipidistian braincase, but with two important modifications. First, the ethmosphenoid moiety in *Latimeria* contains a large median rostral cavity which has three openings on each side to the exterior and contains an organ of unknown function. It now seems probable that this cavity was present in all fossil coelacanths but was absent in the rhipidistians. There is also a median nasal sinus, regarded by the authors as a vestige of an embryonic internasal cavity. Second, the intracranial articulation in the coelacanths is modified by the development of an antotic process, followed, in the Carboniferous, by the loss of the basipterygoid process. Although it is not specifically stated, it appears that the maxillary and mandibular branches of the trigeminus in *Latimeria* emerge at the intracranial fissure, instead of within the otico-occipital segment as in the rhipidistians. Also, the foramen for the profundus nerve is in front of the antotic process. These changes are associated with a basic difference in the jaw mechanism in coelacanths and rhipidistians, but as Romer pointed out, they do not necessarily mean that there is a fundamental difference in the location of the intracranial joint in the two groups.

Tertiary coelacanths are unknown, and the Mesozoic ancestry of *Latimeria* cannot at present be ascertained. The dermal skull pattern, particularly in the snout region, is suggestive of certain Triassic genera rather than the known Jurassic or Cretaceous forms. The reduction in the ossification of the cheek elements and in the supraorbital series also occurred in several Triassic genera, but this may well be a case of parallelism.

The anatomy of the visceral skeleton elucidates a number of points which have not been clarified in the fossil forms. The hyomandibular, previously known in one Devonian genus, has a large canal for the hyomandibular vein and the mandibular and hyoid branches of the facial nerve. This was presumably the situation in most rhipidistians, although in one (*Eusthenopteron*) the hyoid branch was wrapped around the lateral surface of the hyomandibular. The peculiar articulation of the symplectic with the mandible well behind the typical quadrate-articular articulation is known only in *Latimeria,* but it may have existed in the extinct genera as well. There are five branchial arches, presumably the number in the rhipidistians, covered, as in *Eusthenopteron,* with dental plates.

The notochord is a fibroelastic tube, extending anteriorly through the notochordal canal of the otico-occipital segment to the posterior face of the basisphenoid. Cartilaginous "basidorsals" and "basiventrals" are situated above and below the notochord. The neural spines only are ossified. Ribs are absent. The notochord was undoubtedly persistent in all coelacanths back to the Devonian, and there is no suggestion of a perichordal chondrification or ossification. By contrast, all known rhipidistians had perichordal ossification, foreshadowing the condition in tetrapods.

The fins are typical in all respects, with the characteristic "lobed" condition in the paired appendages, as well as in the second dorsal and the anal fins. One point of particular interest is that the ball-and-socket joint between the girdles and their corresponding fin skeleton is the opposite of the rhipidistian-tetrapod condition. In *Latimeria,* the head is on the endoskeleton of the girdle, and the socket is on the proximal element of the fin skeleton. The exoskeletal part of the girdle is not attached to the skull, and the supracleithrum is absent. The internal skeleton of the paired fins differs mainly from that of the rhipidistians in the reduction of the proximal preaxial radials. The pectoral fin has well-differentiated adductor and abductor muscles and deeper, numerous pronators and supinators which enable the fin to rotate about 180 degrees. The pelvic musculature has a similar but somewhat less complicated arrangement. Consideration of the implications of this pattern in relation to the transition from fin to limb will be greatly aided by a description of the innervation, which will presumably be included in the next volume.

In a rather involved concluding statement, Millot and Anthony discuss the possible meaning of certain features found in *Latimeria.* They agree with Romer (for crossopterygians in general) that the persistent notochord and the subdivided braincase are neotenic characters, and they add to these the high proportion of cartilage in the braincase of the post-Devonian coelacanths. In seeking an explanation for the remarkably small brain volume of *Latimeria* in relation to the volume of the cranial cavity (about 1/100) and for the greatly extended stalk of the pituitary, they apparently reject the possibility of allometric growth (for which there is no present evidence) in favor of this being the primitive condition. They attribute the large size of the pedunculated fins to hypertely, related to an increase in body size. In my opinion, a satisfactory explanation for the amazingly small brain of *Latimeria* has not yet been found, while the size of the pedunculated fins may be related both to body size and to function.

There are many details in the skeleton and musculature which cannot be considered here that are of interest from

both phylogenetic and functional points of view. As is inevitable with any anatomical description which follows the organ system plan rather than the regional one, it is not now possible to obtain a complete picture of any part of *Latimeria*. The authors have included some pertinent remarks about blood vessels, nerves, and the brain; but for most of these details we must await the succeeding volumes. They have greatly enhanced the usefulness of the text by making frequent comparisons with the fossil coelacanths and with the rhipidistians.

The illustrations, including x-rays, photographs, and drawings, are numerous and excellent. There are a few unfortunate omissions, and some of the figures have no labels or are inadequately labeled. A lateral view of the complete skull plus visceral arches is, surprisingly, absent, although it would be very helpful. Additional drawings of the visceral skeleton, including the basibranchial elements, would be very desirable.

This volume, and the others to come, represent one of the most important additions to the literature of vertebrate morphology in many decades. The authors are to be congratulated for the thorough manner in which the investigation is being carried out.

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Records of the American-Australian Scientific Expedition to Arnhem Land. vol. 3, *Botany and Plant Ecology*. R. L. Specht and C. P. Mountford, Eds. Melbourne University Press, Melbourne, Australia, 1958 (order from Cambridge University Press, New York). xv + 521 pp. Illus. $19.50.

Arnhem Land, an aboriginal reserve on the northern coast of Australia, was the site in 1948, of a joint American-Australian scientific expedition. Seven months were spent by the participants at selected stations on the mainland and on a large offshore island; during this time, nearly 45,000 specimens of plants and animals were collected, as well as vast quantities of data and specimens for ethnologic and anthropologic study.

R. L. Specht, one of the coeditors of this second volume of the four planned to report the results of the expedition, served as the botanist and ecologist on the venture. He is also the author or coauthor of the sections of the report concerned with the identity of the higher plants and their ecological and phytogeographical interrelationships; the final section, on the ethnobotany of the region, is also written by Specht. Various specialists have contributed chapters on the fresh-water algae, on the Characeae, the marine algae, the Basidiomycetes (with the exception of the Agaricaceae, which are treated in a separate section), the lichens, the bryophytes, and the pteridophytes. A number of new taxa are described in several of these groups, especially among the fresh-water algae.

This is a scholarly work which does not purport to be entertaining reading; it is a technical report of a well-executed scientific study. As such, it is an exceedingly valuable addition to the botanical literature for that part of the world. The two chapters on climate, soils, plant ecology, and the geographical relationships of the flora should be especially useful.

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The Tarantula. William J. Baerg. University of Kansas Press, Lawrence, 1958. 88 pp. Illus. $3.

"To anyone who has learned to know this spider, it is as handsome as a goldfinch, and fully as interesting." Though many an open-minded biologist might understandably take issue with the first assertion, after reading W. J. Baerg's lively and authoritative account of the tarantula, he could not help but subscribe, perhaps with sudden surprise, to the second. Tarantulas are indeed shown to be interesting animals in this small but factually saturated work.

"Tarantula," technically a misnomer, popularly refers to certain reputedly primitive and chiefly tropical spiders of the suborder Orthognatha (or Mygalomorphae). For the uninitiated they are too often *the* spidery horrors par excellence; their gargantuan proportions, often hairy massive bodies, huge projecting fangs, and unlikely turret of tiny gleaming eyes have somehow gained them an often unshakably sinister reputation. Their presumed invariably fatal bites, propensity for bullying human beings, and ability to leap fantastic distances, and other macabre characteristics, are investigated, discussed, and usually discounted by the author in his easy conversational and frequently witty style. He defends tarantulas vigorously and might well have asked, as did one eminent araneologist, why people regard tarantulas' hairy bodies and long, thin legs with frank horror when these same characteristics in Russian wolfhounds are quite acceptable if not desirable.

The book is entirely concerned with the ethology of these spiders, not with their distribution, classification, or identification. Drawing upon 35 years of experience with them, Baerg outlines, probably for the first time, a complete life history, from birth to death, of each sex—no small task when one considers that these chelicerate Methuselahs may live for 20 years or even longer. He provides a first-hand account of their mating habits, describes their seasonal activities, and deals briefly with their natural enemies—chiefly pompilid wasps.

There is a most entertaining and enlightening—though perhaps for some readers a chilling—description of Baerg's quests for the great spiders and their lore in Mexico, Central America, and the Caribbean area. Baerg concludes with a short though informative treatment of tarantula venom and its effects upon laboratory animals and even upon himself. Injection of the venom may be painful, he says, but in the case of the majority of species, the venom seems essentially harmless to man.

The little book was obviously written affectionately and from the vantage points of dedication and much experience. It is good reading, but in addition it is a valuable scientific contribution. In closing Baerg writes: "In fact, for anybody who has the good fortune of having one or more of them living in the backyard, as several of my colleagues have, tarantulas are good neighbors. . . . They stay long enough for one to become much attached to them." In 35 years of close association the author has clearly become attached to them as well as expertly informed about them.

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The Submicroscopic Organization and Function of Nerve Cells. *Experimental Cell Research,* suppl. 5. Academic Press, New York, 1958. 644 pp. Illus. Cloth, $14; paper, $12.

Under the auspices of the Venezuelan Institute of Neurology and Brain Research of Caracas, Venezuela, a group of distinguished investigators from Venezuela, the United States, and several other countries reported, at a symposium held 15–22 March 1957, in Caracas, on recent advances in the fine structure and function of nerve cells.

The collected papers in this volume are grouped under five major headings: "The nerve fibers," "The nerve cell membrane," "The neurons," "The synapses," and "The receptors." These symposium papers do not represent an integrated approach to any one topic but are concerned with various problems of both investigative and theoretical interest. Some of the data presented are not