Book Reviews

Tihuanacu: the cradle of American man. **Arthur Posnansky. New York: J. J. Augustin, 1945. Vol. I: Pp. viii + 158; Vol. II: Pp. viii + 246. (Illustrated; bound in one volume; text in English and Spanish.) $30.00.**

In this large, expensive, and beautiful work, which includes two of three projected volumes, Prof. Posnansky, Bolivia's leading archaeologist, summarizes a lifetime of research in the rich archaeological remains of the Bolivian altiplano. The work contains many excellent descriptions of the sites and monuments, but it is mainly of interest in illustrating how a scientist, working alone and without reference to his colleagues, arrives at results wholly at variance with theirs. Scientists may, of course, make outstanding contributions by courageously defying tradition; but they can rarely afford to ignore established methodology, accumulated data, and other gains of the past.

Ignoring his colleagues, except to hurl an occasion invective at them, Prof. Posnansky erects a theoretical structure that is entirely his own. It is of interest to compare it with that of his fellow archaeologists.

Tihuanacu (usually spelled Tiahuanaco) is an archaeological site on the Bolivian altiplano famous for its monolithic gateways, carved stone blocks, idols, and art style. Archaeologists have found the art style widely spread in the Andes, and, by means of stratigraphy and other standard archaeological methods, they have dated this phase of culture at the close of the first millennium A.D. It is generally regarded as a comparatively late manifestation of an advanced, prehistoric Andean civilization which developed through several distinctive periods over some 2,000 years.

Prof. Posnansky, like so many local archaeologists who do not build on the work of their colleagues, sees his Bolivian Tihuanacu remains as the product of autochthonous development and as the source of all American civilization. He postulates five local periods. During the first, the superior Kholla, who seem to be identified with the modern Aymara, subjugated the inferior, cave-dwelling, Arawak-speaking natives. The racist dogma and the identification of the language of these early people are favorite themes of the author. After a glacial period, which is correlated with that of other parts of the world, Periods 2 and 3 brought the flowering of Tihuanacu, some 10,000 to 15,000 years ago. Tihuanacu's decline was followed by Period 4, when the polygonal stone work at Cuzo was made. (This stone work is now identified as Inca.) In characterizing Period 5 by the "monumental adobe" structures, which are found mainly on the coast, the author seems to disregard the fact that his colleagues find that such structures date from all periods of prehistoric Peru. Period 6 is Inca—that is, of the historic, Quechua-speaking peoples.

Failing to use established ceramic sequences, Posnansky based his reconstruction on a series of assumptions which have not been generally accepted: that the so-called Arawak cave dwellers are oldest because their skulls are fossilized; that the Tihuanacu culture flourished during Periods 2 and 3 because the altiplano was then nearer sea level and had a more benign climate; that this culture declined, because of uplifts, vulcanism, increased cold, recession of Lake Titicaca, and a consequent decrease of population. Whereas other archaeologists prefer a relative chronology for their periods and hazard an absolute chronology only by general comparisons with such areas as the Maya, who erected dated monuments, Prof. Posnansky bases his on assumed glacial chronology, on an assumed uplift of the Andes and changes in the level of Lake Titicaca, and on a variety of astronomic calculations which he infers from the arrangement of temples, monoliths, and other structures.

That Tihuanacu was the cradle of American civilization Posnansky deduces from a series of design elements, or "signs," such as "staircase" (stepped element), "star," "condor," "puma," and the like, which he identifies at Tihuanacu and assumes to have been spread by migrating Khollas to wherever such elements are found throughout the Americas, even as far away as the Hopi of Arizona. This postulated origin and spread of the Tihuanacu civilization is accomplished with a complete disregard of the tremendous amount of work done by competent archaeologists throughout the Americas.

Leaving aside its interpretative features, Prof. Posnansky's volumes are a magnificent factual contribution, containing the most important corpus of data yet available on the monolithic doorways, steps, walls, canals, idols, and other features of this interesting and important culture.

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Bibliographia araneorum: analyse méthodique de toute la littérature araneologique jusqu'en 1939. **(Tome I.) Pierre Bonnet. Toulouse: Frères Douladoure, 1945. Pp. xvii + 832. 3,500 fr.**

This is an attempt to make a complete survey of all scientific literature dealing with one group of animals, the spiders, and serves as an example of the type of comprehensive bibliography that all fields could use if such were available. Prof. Bonnet has assembled over 8,000 titles, arranged alphabetically by authors, and then has made a thorough analysis and grouping of these papers by every sort of heading that a student might need—general heads such as usefulness to humans, technical methods, and phylogenetic relations; anatomy and physiology, such as coloration, glands, and heart movements; ethology, including longevity, catalepsy, courting habits, etc.; geographic distribution by states, departments, counties, islands, etc.; and paleontology.

Included is a brief summary of the outstanding work done in arachnology from the time of Aristotle to the

present, and a biographic account of 124 araneologists from Linnaeus to date, with portraits of 106 of these. There is also a discussion of typographical and nomenclatural rules employed in this volume, and indexes of authors and subjects.

Prof. Bonnet did his own editing and is preparing a supplement in which any corrections and additions that come to his attention will be made. A brief account in the Postface of the struggles he had with governmental red tape and paper shortages will constitute a bond of sympathy with any harassed editor in this country.

The second and third volumes, yet to be published, will arrange the systematics of all spiders known to the author and a synonymy of some 200,000 names. This work will, of course, be an invaluable reference tool to any zoologist and naturalist, as well as a model and a challenge to students of fields other than arachnology.

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Howell's textbook of physiology. (15th ed.) John F. Fulton. (Ed.) Philadelphia: W. B. Saunders, 1946. Pp. xxxv + 1304. (Illustrated.) $8.00.

Only a few resemblances between this and the earlier editions remain. Among them are the retention of the original author's name, now moved up into the title, and a barely recognizable similarity to the earlier format. Under the able editorship of John F. Fulton the book has been completely revised and rewritten and stands today as a fitting memorial to one of America's great medical educators. Twenty-four physiologists have contributed to the work, 15 of them from Yale.

Of its 1247 pages of text, 545 are devoted to nervous and sensory physiology. However, those who wish an authoritative account of modern nervous physiology will be satisfied with the large proportion of space allotted to this subject, for it would be difficult indeed to find a more thorough treatment of this complex field. It would be futile to try to summarize even the full body of material presented; suffice it to say that it is all there. The three major contributors to this section of the book, J. F. Fulton, D. P. C. Lloyd, and T. C. Ruch, deserve only the highest praise for the manner in which they have synthesized and summarized those advances in nervous, muscular, and sensory physiology resulting from the increased application of the methods of oscillography to these fields.

A section on blood and circulation comprises 309 pages and is as admirably done and as up to date in scope as the preceding one. It is a composite effort on the part of D. J. Hitchcock, D. H. Barron, H. Lamport, and J. F. Fulton and includes a chapter on the pulse by W. F. Hamilton, who is certainly well equipped to handle this subject. Areas in which recent advances in circulatory physiology have been made, such as the fractionation of plasma proteins, electrocardiography, and ballistocardiography, and the coronary and cerebral circulation, are well covered.

Since 854 of the 1247 pages of text have been devoted to nervous, sensory, and circulatory physiology, not much space is left for the rest. Consequently, the treatment accorded such important fields as respiration, kidney function and water balance, digestion, etc. is less comprehensive than that in the earlier sections of the book. However, although kidney physiology, including a discussion of water balance, takes up only 50 pages, into this short space R. W. Clarke has managed to compress all the essential facts, including an able presentation of Smith's recent work on tubular excretory (absorptive) mass. Such a compact presentation will satisfy the medical students who have long suffered in their textbooks lengthy treatments of certain physiological subjects more suitable to monographs for the advanced specialists.

Again, in the section on respiration, we are greatly indebted to R. F. Pitts for an excellent and succinct summary of the recent work in this field, including a discussion of the newer concepts of the respiratory center to which Pitts himself has added so much. It is interesting to note that the section on digestive physiology was written by G. R. Cowgill, who is also responsible for the same section in another well-known physiology text. Metabolism and nutrition are well done by J. R. Brobeck and include much new material on temperature regulation, vitamin action, and intermediary metabolism. The section on reproductive physiology, edited by W. U. Gardner, maintains the same high standards of the others.

Clinical applications of physiology are not discussed except as they serve to clarify the strictly physiological material and to enliven the text. Recent trends in physiology are nicely balanced in their presentation and should orient the student as to the direction in which this science is moving without confusing him unduly with conflicting opinions. At the end of each section is a short bibliography which gives any individual who wishes to read further in the subject a good start in his quest for the original literature. There is happily included as an introductory chapter an historical account of the development of American physiology. An excellent index greatly increases the usefulness of the book.

A section devoted to the endocrines is lacking. This was obviously deliberate policy, the material usually incorporated in such a section being scattered through the book under those parts dealing with carbohydrate metabolism, electrolyte and water balance, etc. This procedure has much to recommend it since it diverts attention from the endocrine glands as anatomical entities to their function as integrators of bodily activity. But in this particular instance the interrelationships which exist between the endocrines themselves and which play an important role in the regulation of bodily function are completely neglected. For instance, it would be hard indeed for the student to discover that thyroid activity is controlled by a reciprocal relationship between the thyroid and pituitary gland. Further, this reviewer would be interested to know if anyone can find mention of the parathyroid gland. He could not.

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