An attempt to ascribe the universals of language or society to "neurognostic models" present in all infants because they are to a substantial extent under genetic control must begin by considering in detail how far such universals may be imposed by the anatomy and physiology of the human body and the nature of the physical environment. It is possible that some features of behavior are universal because they depend, for example, on the fact that all women have two breasts, or that objects fall toward the earth's surface. I am sure that it is unfair to Chomsky to present as a major insight into the genetic basis of language that "The boy broke the window" and "The window was broken by the boy" are sentences having a common deep structure. As long as bricks are hard and glass is brittle any description of such an event is bound to convey the same small number of pieces of information.

A major opportunity was missed by the failure to compare in as great detail as possible the data now available for specific aphasias with modern theories of linguistic deep structure. Perhaps the loss of particular categories of verb following certain lesions can be viewed as a test of such linguistic theory, perhaps not: the arguments involved must rest on a great deal of detailed comparison which is not undertaken here.

Lévi-Strauss's position is also presented fairly cursorily, although here conciseness is more reasonable. The authors concentrate on the hypothesis that the "primitive mind orders things in terms of opposites." They suggest that such a tendency could be profitably explored by studying neural structures that are involved in the analysis of spatial relations, and advance the parieto-occipital region as a candidate. The organization of abstract and contrasting concepts into a spatial display by mechanisms evolved to deal with real spatial relations is clearly a fascinating subject for study. A real weakness, at least in presentation, is that some readers will require evidence as to how far the binary oppositions proposed by Lévi-Strauss as basic to the organization of complex social structures exist in minds other than his own.

The authors add three other examples of their own of "genetically determined structures underlying cognition." These are: (i) social bonding, which is rather oddly described as "alignment of (experience of) self with conspecifics to form a group," (ii) mastery and euphoria versus helplessness and depression, and (iii) phobias and "positive alignments." Again there is little attempt to review the published evidence, although this could have been very valuable. In the case of phobias, for example, a good deal is now known in animals of the basis for species-specific responses to predators.

Finally, the biological content of the book has serious faults. In general, the position is taken that increased complexity of neural connections was produced by allometric growth of the human brain as a consequence of increased body size, and that the new abilities that resulted were only then subject to direct selection pressure. The consequences of increased brain size following an increase in body size remain a fruitful field of argument. I believe that their importance may be exaggerated: within animals of very similar body plan allometry is usually not marked. In any case, in the human line it is quite clear that much of the absolute increase in brain size is due not to allometry but to a change or changes in the relation of brain size to body size, which in turn presumably reflect new selection pressures on behavior. Any balanced treatment should also include the evidence that special abilities characteristic of man, such as the ability to mimic complex sounds or to convey accurate information about the position and distance of absent food sources, can evolve (as, for example, in parrots and in bees) independently of each other.

It is also disturbing to a biologist to be told that social structure ("culture") is selectively neutral, that selection in man was for increasing neural complexity (rather than for the ability to do something), and that depression evolved as a means of eliminating failures from a social group.

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Far Eastern Prehistory

The Traditional Culture and Society of Korea. Prehistory. Papers from a conference, Honolulu, June 1971. RICHARD J. PEARSON, Ed. University of Hawaii Center for Korean Studies, Honolulu, 1975. viii, 210 pp., illus. Paper, $4.50. Occasional Papers of the Center for Korean Studies, No. 3.

Prehistoric research in Korea was virtually monopolized by Japanese before 1945. When the Japanese left, there were few trained Korean personnel to conduct the inquiry into the prehistoric past of their own land. Papers in this volume summarize the accomplishments, in spite of the often unfavorable sociopolitical circumstances, of the last two and a half decades. The three Korean contributors are from South Korea, but the papers attempt to cover the cultural remains of both North and South Korea, from the Paleolithic beginnings to the early Metal Age in the first millennium B.C.

The volume editor, Pearson, describes Korean prehistory as an "infant discipline" and states that "the major temporal and cultural divisions are still being blocked out" (p. 1). It is hoped that the completion of this process will see definition of temporal units that are meaningful in the Korean situation. This reviewer fears that the North Korean scholars' argument for the existence of a real "Bronze Age" in Korea, summarized by Jung-bae Kim, may result in the creation of an artificial cultural unit. Certain Japanese scholars in the past called those assemblages which include various forms of bronze, iron, and stone artifacts, among them stone implements duplicating bronze forms, "Aeneolithic." This term, with a possible connotation of derivativeness, apparently offends Korean scholars. Whether these first-millennium-B.C. assemblages should be called "Aeneolithic" or "Bronze Culture" seems a curiously futile argument. From this distance, it appears that the cause of national pride would be better served by a chronological framework that is most applicable to the task of understanding Korean culture history in its own terms.

Similarly, it is misleading to label the assemblages from the lower strata of the Sŏkchang-ni as "Lower" and "Middle" Paleolithic, on the basis of general resemblances of specimens to artifacts recovered at Ting-ts'un in North China, and even at La Quina, France. Geological and chronometric information is urgently needed. Even when this is available, one wonders whether the tripartite division of the Paleolithic into "Lower," "Middle," and "Upper" is a really meaningful framework for dealing with East Asian assemblages. I have found that it is not, as far as Japanese assemblages are concerned.

Ethnic identities of prehistoric populations constitute one of the major concerns of the authors, and cultural changes are seen as the results of migrations and influences. Wŏn-yong Kim, following the long-established practice of dividing Korean "Neolithic" pottery into Plain and Comb-pattern, suggests that both the early Plain pottery group and the early Comb-pattern group were Paleo-Asiatics who arrived from Siberia around 4000 B.C. and 3000 B.C., respectively. This was followed, beginning about 2000 B.C., by "sporadic migrations of Manchu-Tungus," who are credited with the introduction of agricultural technology into Korea. The Comb-pattern Paleo-Asiatics "were gradually chased away or assimilated by the incoming Tungusic bands" (p. 85). The end of the "Neolithic," and the beginning of

the "Bronze Age," is marked by the arrival of a new Tungusic group from Manchuria, the "Ye-Maek," whose cultural affiliation, according to Jung-bae Kim, is to be sought in the Karasuk culture on the Upper Yenisei valley. Later prehistory of Korea, leading to the formation of native states, was not covered by the conference.

What Pearson describes as the situation in which "the Western reader has virtually nowhere to turn to find a summary of recent accomplishments or an outline of what problems preoccupy field workers" (p. 1) has been remedied to some extent by the recent publication of "Tongsamdon: A Contribution to Korean Neolithic Culture History" by L. L. Sample (*Arctic Anthropology* **11**, No. 2 [1974]). Nevertheless, the three key articles of this volume, written by Korean scholars themselves, present useful information on the state of prehistoric research in Korea, with respect not only to the impressive results of recent years, but also to stated and unstated research goals and assumptions. Illustrations would have made it easier to follow the Korean contributors' arguments. Comments by Kwang-chih Chang and three Japanese scholars provide comparative perspectives, and the thoughtful introduction by Richard Pearson makes useful reading in itself.

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Photosynthesis

Proceedings of the Third International Congress on Photosynthesis. Rehovot, Israel, Sept. 1974. MORDHAY AVRON, Ed. Elsevier, New York, 1975. Three volumes. xx, 2194 pp., illus. $133.50.

These three volumes provide short summary papers on photosynthetic work from laboratories throughout the world as well as references to more detailed research papers. Participation in these conferences is always related to their location, and this one is no exception. By my count there were 155 participants from Europe, 42 from the United States, 65 from Israel (site of the Congress), and only 11 from countries outside these regions, the most notable absence being that of researchers from Russia.

Volume 1 contains 106 papers on photochemistry and electron transport in the photosynthetic apparatus. Progress in this area of photosynthetic research, while steady, is not proceeding at the rapid rate that characterized the 1950's and early 1960's. Those remarkable years gave us photosynthetic phosphorylation, enhancement, the two light reactions, cytochromes, plastocyanin, ferredoxin, P700, variable fluorescence, and the Mitchell hypothesis. Present work is largely an extension of these discoveries and models.

Volume 2 presents recent work on photosynthetic phosphorylation and carbon metabolism. Work on the latter phenomenon has received considerable new impetus from studies on C_4 plants (plants in which the first product of photosynthesis is a C_4 acid) and from a renewed interest in photorespiration. The phenomenon of photorespiration is of particular practical importance because a large portion of the carbon fixed by almost all C_3 plants (plants in which the first product of photosynthesis is phosphoglycerate) is subsequently lost by photorespiration. The papers by W. A. Laing, W. L. Ogren, and R. A. Hageman, by R. G. Jensen and J. T. Bahr, and by M. R. Budger, T. J. Andrews, and C. B. Osmund all develop the original observation of Ogren and G. Bowes (*Nature New Biology* **230**, 159 [1971]) that the enzyme ribulose diphosphate carboxylase is also an oxygenase, producing 3-phosphoglycerate and phosphoglycolate from ribulose diphosphate. These observations provide us with a valuable clue to the mechanism of oxygen inhibition of photosynthesis, as well as with a possible means of understanding photorespiration. In addition, a new question concerning the real quantum requirement of photosynthesis is opened. If we assume that the normally accepted value of 8 to 10 quanta per molecule of CO_2 fixed was determined in plants carrying out photorespiration, then the real quantum requirement should be considerably lower than the accepted value. Such a result would be in conflict with the quantum requirement of 10 predicted by the two light-reaction scheme as it is usually formulated. Perhaps these researches will soon challenge this cherished model.

Volume 3 presents recent work on the composition and development of the photosynthetic apparatus in higher plants, algae, and bacteria. These studies are characterized by observations on the sequential appearance of membrane peptides, lipids, and photochemical activities during greening, the function of stacked as compared with unstacked membranes, and the isolation of fractions enriched in one or the other photochemical reaction.

This valuable and beautifully bound collection of papers, while financially beyond the reach of many students, is an essential acquisition for biology research libraries.

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Books Received

Abnormal Haemoglobins and Thalassaemia. Diagnostic Aspects. Proceedings of two workshops, Istanbul, Aug. 1974, and Jerusalem, Sept. 1974. R. M. Schmidt, Ed. Academic Press, New York, 1975. lvi, 372 pp., illus. $19.50.

Adult Fitness and Cardiac Rehabilitation. Proceedings of a symposium, La Crosse, Wis., 1974. Philip K. Wilson, Ed. University Park Press, Baltimore, 1975. xx, 408 pp., illus. $19.50.

Advanced Fluid Mechanics. An Introduction. A. J. Raudkivi and R. A. Callander. Halsted (Wiley), New York, 1975. xii, 326 pp., illus. $27.50.

Advances in Experimental Social Psychology. Vol. 8. Leonard Berkowitz, Ed. Academic Press, New York, 1975. xii, 340 pp. $19.50.

Advances in Liquid Crystals. Vol. 1. Glenn H. Brown, Ed. Academic Press, New York, 1975. xii, 320 pp., illus. $31.50.

Algal Cultures and Phytoplankton Ecology. G. E. Fogg. University of Wisconsin Press, Madison, ed. 2, 1975. xvi, 176 pp., illus. $12.50.

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Analysis and Metaphysics. Essays in Honor of R. M. Chisholm. Keith Lehrer, Ed. Reidel, Boston, 1975. x, 318 pp. $39.50. Philosophical Studies Series in Philosophy, vol. 4.

The Analysis of Detergents and Detergent Products. G. F. Longman. Wiley-Interscience, New York, 1975. xvi, 588 pp., illus. + appendices. Paper, $33.

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Atlas of Optical Transforms. G. Harburn, C. A. Taylor, and T. R. Welberry. Cornell University Press, Ithaca, N.Y., 1975. vi, 34 pp. + plates. $15.

Atmospheres of Earth and the Planets. Proceedings of an institute, Liege, Belgium, July 1974. B. M. McCormac, Ed. Reidel, Boston, 1975. viii, 456 pp., illus. $65. Astrophysics and Space Science Library, vol. 51.

Atomic Absorption Spectroscopy. James W. Robinson. Dekker, New York, ed. 2, 1975. xii, 184 pp., illus. $14.75.

Behavior Therapy with Children. Vol. 2. Anthony M. Graziano, Ed. Aldine, Chicago, 1975. xiv, 640 pp., illus. $19.95.

Biochemical Fluorescence. Concepts. Vol. 1. Raymond F. Chen and Harold Edelhoch, Eds. Dekker, New York, 1975. xiv, 408 pp., illus. $29.50.

Biophysical Chemistry. Physical Chemistry in the Biological Sciences. Readings from *Scientific American.* Victor A. Bloomfield and Rodney E. Harrington, Eds. Freeman, San Francisco, 1975. viii, 232 pp., illus. Cloth, $12; paper, $6.95.

Brain Mechanisms and the Control of Behav-

(Continued on page 210)