# Book Reviews

**The Beginnings of Chinese Civilization.** Three Lectures Illustrated with Finds at Anyang. Li Chi. Foreword by M. Rogers. University of Washington Press, Seattle, 1957. xvii + 123 pp. Plates. $6.50.

In the '30's of the present century, systematic excavations at the capital of the Shang Kingdom (circa 15th to 11th centuries B.C.) revealed a wealth of information about the beginnings of Chinese culture, parallel with the greatest discoveries at Troy, Knossos, or elsewhere. Li Chi, who is justly compared by the editor of this little book with Heinrich Schliemann, was in charge of these excavations in the North China plain for a number of years and today is universally honored as one of the greatest living Chinese archeologists. No reader interested in such a subject will regret the cost of this book, illustrated as it is with so many plates, some quite new.

The first chapter gives a general authoritative account of the paleolithic and neolithic times in China, showing how the organization of the first state power was marked by decisive new developments—an outstanding bronze metallurgy, the formation of the first system of Chinese script (the oracle-bone characters), the introduction of chariots, an advanced stone-carving art, *terre pisé* buildings, elaborate royal burials, and new kinds of ceramics, involving kaolin and glaze. In the second chapter Li describes the greatly increased use of animals, both wild and domestic, including the buffalo, which distinguished the Shang people from their neolithic predecessors. Traces of similarities with western Asia now appear, such as phallic jar covers, and a "hero-and-beast" motif which recalls the Gilgamesh Epic of the Fertile Crescent; Amerindian totem poles are suggested by certain Shang carvings.

Opinions may differ about the convincingness of these parallels, but they are more acceptable than the suggestion made earlier of a connection between certain ancient Chinese "hairy man" legends and the descendants of the Old Man of the Chou-Kou-Tien Upper Cave —a paleolithic person. Li also seems to smile upon the identification of certain faces on Shang bronzes as being those of Negroes or Negritos; I am open to conviction but not yet convinced. More immediate agreement is won by the finding that the rectangular bronzes of the Shang derive from wooden forerunners, while the round ones derive from pottery predecessors.

Perhaps Li's most important disclosure in this book is that concerning the analyses of Shang bronzes carried out by the chemists of Academia Sinica. Differences between contemporary objects thus demonstrate that the Shang people knew the differences in properties brought about by varying the percentages of copper and tin (and lead) in their bronze. The knowledge expressed in a famous text of the third century B.C. is thus clearly exhibited 1000 years earlier.

The book ends with a discussion of the typology of bronze knives, vessels, and dagger-axes. The only criticism which could be voiced concerns the publisher and editor rather than the author; the Chinese characters inserted in the text are microscopically small, and their insertion is not systematic. It was a pity to "spoil the ship for a ha'pennyworth of tar."

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**Nonparametric Methods in Statistics.** D. A. S. Fraser. Wiley, New York; Chapman & Hall, London, 1957. 299 pp. Illus. $8.50.

One area of statistical research that has received increased attention in recent years is the area of nonparametric statistics. Historically, the development of statistical inference was concentrated in the area of parametric statistics—in techniques which made many assumptions about the universe from which the observations were drawn. These assumptions are generally in the form of the parameters or population values that characterize the population. The most famous of these populations has been, of course, the normal population.

In the development of nonparametric statistics, fewer assumptions are made about the universe from which the sample observations are drawn. In fact, then, these nonparametric methods deal with statistical inference on a more general level than do parametric methods.

In this volume the author sets himself the task of collecting the developments in the field of nonparametric methods that have taken place in recent years. His approach is not merely to collect and present a set of techniques. His approach has been a more general one—"to restate the standard problems in quite general terms and then look for adequate statistical procedures." Among the standard problems he discusses are single-sample problems (the problems of fit, location, and symmetry), randomness problems, and randomized blocks and other experimental designs.

The first two chapters offer an excellent review of the general techniques of estimation and hypothesis testing, which forms the basis for the subsequent discussion of nonparametric methods. The volume constitutes a welcome addition to the statistics library and will reward anyone paying it the careful attention it deserves.

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**Biochemical Disorders in Human Disease.** R. H. S. Thompson and E. J. King, Eds. Academic Press, New York, 1957. 843 pp. $12.60.

This book consists of a series of essays on 20 different types of diseases, written by 31 authors of whom about one-third are from American, and two-thirds from British, laboratories. The editors are both chemical pathologists.

The orientation of the authors is for the most part that of pathologists; they have, generally, written about the diseases in question in a traditional manner with, however, the realization that biochemistry is of vital and growing importance and must be brought into the discussion. It is 50 years since what was presumably the first book entitled *Chemical Pathology* was published. In spite of the growing emphasis on biochemistry, the present volume cannot be said to be biochemically oriented to a high degree. This is illustrated by the fact that among the topics which are, in most cases, omitted in the index and which do not enter into any serious discussions in the text are adaptive enzymes, biochemical genetics, coenzyme A, cytochromes, disease susceptibility, flavoprotein enzymes, gene mutations, the genetotrophic concept, pantothenic acid, pyridoxin, pyrimidines, riboflavin, templates, and viruses. As the editors state in the preface, no separate chapters deal with diseases of the skin, infectious diseases, gerontology, or cancer.

In spite of limitations stated or implied, this is a valuable volume and con-

tains, in an orderly form from the pathologist's point of view, a review of the recent findings with respect to the diseases discussed. Some of the material is excellent. The chapter headings give an excellent idea of the scope of the volume: "Diseases of the Gastro-intestinal Tract," "Diseases of the Liver and Biliary Tract," "The Anaemias," "Diseases of the Blood, the Clotting Mechanism," "Hypertension," "Diseases of the Kidney and Genito-urinary Tract," "Adrenal Diseases," "Diseases of Iodine Metabolism," "Diseases of Bone and the Parathyroid Gland," "Diseases of the Nervous System," "Diseases of Muscle," "Diabetes Mellitus and Hypoglycaemia," "Disorders of Nutrition," "Miscellaneous Disorders of Metabolism: I. Some Abnormalities of Amino-acid and Haemoglobin Metabolism," "Miscellaneous Disorders of Metabolism: II. Connective Tissue Disorders," "Miscellaneous Disorders of Metabolism: III. Porphyrias," "Miscellaneous Disorders of Metabolism: IV. Haemochromatosis," "Miscellaneous Disorders of Metabolism: V. Glycogen Storage Diseases and Galactosaemia," "Miscellaneous Disorders of Metabolism: VI. Lipidoses," and "Disorders of the Reproductive Organs."

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**Stress and Strain in Bones.** Their relation to fractures and osteogenesis. F. Gaynor Evans. Thomas, Springfield, Ill., 1957. 245 pp. Illus. $6.50.

In this short monograph the author has attempted to bring together most of the data, including his own extensive researches, pertaining to the mechanical behavior of various bones, the structural characteristics of bone as a tissue, and the relationship of these mechanical data to osteogenesis, fracture healing, and the production of fractures.

He has wisely included a simple and easily understood introductory chapter on the elementary principles of mechanics and stress analysis and a glossary of engineering terms at the end of the book. Nine of the 14 chapters (not including the introduction) are devoted to the mechanical behavior of bones and bone, including methods and mathematical analyses. The rest are devoted to the correlation of these data with biological phenomena.

Throughout the book the author has very carefully and critically evaluated the vast literature in the field and has correctly pointed out a number of errors, both in semantics and interpretation, which have been perpetuated for many years; in doing so he has done the field a distinct service. I believe, however, that the sections on the purely mechanical aspects of the problem could have been improved if the author had included a small section, with diagrams and illustrations, on the external force systems causing stress and strain in bone—that is, gravity, inertia, ground forces, and muscle forces—demonstrating how they produce stress and strain in bone. This is particularly true of muscle action, since failure to include the effect of muscle action vitiates much of the published data on the stress distribution, stress magnitude, and so forth, on intact long bones. Most of these tests have been carried out on statically or dynamically loaded femurs by means of one applied force—for example, on the head of the femur.

Since muscles act not only by increasing the magnitude but by changing the line of action of the resultant force, and exert their effects only between their origins and their insertions, the resultant stress distribution and the magnitude of the stress can be markedly altered. Static or dynamic tests, therefore, on firmly fixed femurs, for example, loaded through the femoral head, with the opposing force only at the tibial end, have very little in common with the actual distribution in the femur *in vivo*. The author is aware of this, since he included some of Pauwels' work on models, in which various braces were applied to simulate certain muscle actions, but I do not think he emphasizes sufficiently the deficiency of data collected on *in vitro* loading and the impossibility of correlating this with the actual conditions as they are *in vivo*. The studies of the author and his collaborators recording strain directly from living animals should make it possible, in the future, to circumvent a great many of these difficulties.

The mechanical data which the author has compiled from his own and other researches on the structural characteristics of various bones and on bone as a tissue should prove very valuable to workers concerned with the safety and tolerances of the human body under circumstances of mechanical stress (as in automobiles, airplanes, and so forth) and should help these groups in designing safer vehicles.

The section devoted to fracture production should prove valuable to orthopedic surgeons, particularly in the evaluation of the type of internal or external support to be used in immobilizing fractures and in protecting against the type of bone stress most likely to disrupt continuity of the opposed bone surfaces.

In the sections which will most interest biologists—those on the relationship between mechanical stress, osteogenesis, bone architecture, fracture healing, and so forth—the author is unavoidably hampered, not only by the lack of previous critical experiments, but also by the fact that in the past the problem has not even been defined conceptually in terms of modern biology. Attempts to correlate trabecular orientation of spongy bone and computed or *in vitro* determined stress lines in models and intact long bones is quite naive, and this is well brought out by the author. Unfortunately, most of the literature in the past has focused on gross architectural changes such as trabecular pattern in spongy bone, but little has been done with ultrastructural changes in compact bone. For the most part, the experimental work in the past has not been very critical or conclusive. Most of these deficiencies are well discussed by the author, including the lack of any good suggestions about the mechanisms involved whereby mechanical stress alters bone architecture, healing, and so on. Again, I believe the author might have improved this section with some more pointed comments on the need to consider the biological effects of mechanical stress at various ultrastructural and structural levels. The orientation of collagen fibrils, primitive fibers, fibers, fiber bundles, and so forth may be quite different even in compact bone, and the reaction to mechanical stress at these different levels may be quite different. The same is true of the collagen in trabeculae. There may be no relationship between the orientation of the gross trabeculae, the orientation of the ultrastructural components of the trabeculae and their relative behavior to mechanical stress. If mechanical stress does affect the production and resorption of bone and the ultrastructural arrangement of the components of bone, it does so by physiochemical means not yet even defined conceptually, let alone demonstrated experimentally.

In his well-written monograph, Evans has, by assembling the data, critically evaluating them, and pointing up deficiencies in the biological approaches to this important problem, pointed the way, and this book should do much to stimulate more basic research in this field.

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**William Harvey.** His Life and Times: His Discoveries: His Methods. Louis Chauvois. Philosophical Library, New York, 1957. 271 pp. Illus. $7.50.

The celebrations of the tercentennary of William Harvey's death in 1957 may have motivated many to look for an adequate biography of the physician of Charles I, who made what is probably the greatest physiological discovery of all time. They will have discovered to their surprise that no recent work of this kind exists.