rich museum and laboratory. This led to his descriptions of neurologic syndromes that will be retained in medicine until clarification of their etiologies; even then, Charcot's name will be indelibly part of their recognition.

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Indians of the High Plains. From the prehistoric period to the coming of Europeans. George E. Hyde. University of Oklahoma Press, Norman, 1959. xiii + 233 pp. Illus. $4.

George Hyde has undertaken the formidable and challenging task of presenting a "coherent picture" of the Indian occupancy of the western plains prior to the year 1800. Mainly, the story is one of the Plains Apache who dominated the central and southern plains from about 1500 to 1700, and of the Comanche and Shoshone ("Snakes") who overran much of the central and northern plains during the 18th century. The data utilized come largely from historical documents, buttressed here and there by archeological evidence turned up in the past quarter century. Three maps and 14 plates (the latter including two particularly interesting mid-18th century deerskin paintings believed to relate to the contemporary Plains Indians) supplement the text.

The author has assembled an impressive body of data, much of it from obscure sources which present-day students too often overlook or neglect in their piecemeal treatment of certain segments of the larger problem. Steeped in years of thinking and reading, Hyde has earned the gratitude of his readers for his region-wide interpretations and for compiling a plausible reconstruction of human activity against which future findings and interpretations can be compared. The end result of his labors makes entertaining reading for anyone dogged enough to stay with the book through its mass of detail and frequent shifts of locale.

The preface describes this as "a reading book, not a treatise"; hence the author disavows a need for the careful documentation that should characterize any scholarly work and which readers have come to expect in this "Civilization of the American Indian Series," of which this is the 54th volume. More serious is the author's penchant, where direct documentation or other supporting evidence is lacking, for suggesting a tentative identification or interpretation and, thereafter, for handling these suggestions as established facts. Because many of the documents for this period are decidedly sketchy and vague and because they frequently use tribal designations which are not readily correlated with the better documented groups of later periods, other interpretations than those set forth still merit serious consideration. Sharp reactions to many of Hyde's views must be anticipated.

Despite these and other shortcomings—a certain archeological naiveté, and the need for healthy skepticism on the part of the reader—Hyde's book should have a place on the shelf of anyone seriously interested in the early historic Indians of the western plains.

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Report on the State of Machine Translation in the United States. Yehoshua Bar Hillel. Technical Report No. 1. Prepared for the U.S. Office of Naval Research, Information Systems Branch, Jerusalem, Israel, 1959 (available as PB151746 from Office of Technical Services, U.S. Dept. of Commerce, Washington 25, D.C.). 48 pp. + appendixes. $2.25.

This critique is a sobering evaluation of the many misconceptions engendered by overly optimistic approaches to fully automatic, high-quality machine translation (FAHQMT). It is based upon the author's visits in late 1958 to most of the 12 major mechanical translation (MT) centers in the United States, discussions with members of the two British centers, and a study of the principal publications of all these centers.

It recommends that fully automatic, high-quality machine translation be renounced and that future practical research be concentrated on either fully automatic, low-quality translation or partly automatic, high-quality translation; it further recommends that basic research into language structure, models, and so forth be divorced from immediate applicability to mechanical translation. Ten proposals for the organization of further research and for the improvement of cooperation are made.

The appendixes include copies of two papers, presented before international conferences, on the theoretical limitations of FAHQMT and an original paper entitled "A demonstration of the non-feasibility of fully-automatic high-quality machine translation."

Speculating on the author's dim view of the possible success of mechanical translation, one might point out that it is easy to construct hypothetical phrases (as the author has done) which cannot be translated by any conceivable machine; this is so easy, in fact, that much of what is written is unintentionally untranslatable, either by machine or human being. If a passage isn't meaningful and unambiguous in the original language, then attempts to translate it into something meaningful are not even a proper activity. In such cases one is tempted to rewrite the passage, and if this is done, it should be recognized that it is not a translation, but the work of a new author. The point here is that since, to a degree, the benefits of mechanical translation are denied us by the machine's intolerance of sloppy communication, we should be more precise in our writing, and if necessary develop a language that permits the necessary degree of precision and nonambiguity.

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Elements of Solid State Theory. Gregory H. Wannier. Cambridge University Press, New York, 1959. 269 pp. $6.50.

In this volume, Wannier presents us with a readable and cogent account of a considerable segment of modern, solid-state theory. The volume is limited to a size which will not discourage a reader seeking a cultural acquaintance with the subject. It is, however, a book for the physicist, and most topics are discussed at a high level of sophistication.

Two of the early chapters (chapters 3 and 4) have a special value for they treat topics which have only recently attained prominence in the literature of physics and which are therefore not treated in the familiar textbooks. Chapter 3 is devoted to lattice dynamics and includes a discussion of topological aspects of the distribution of the vibrational frequencies of crystals. The recognition of the influence of special points on the form of the frequency

distribution function is probably the most important piece of qualitative insight into the form of the frequency distribution since the introduction of the Debye model, and I am pleased to see it presented so lucidly here. A large fraction of chapter 4, entitled "Co-operative phenomena in solids," consists of a discussion of the Ising model and its application to a variety of solid state, cooperative phenomena and constitutes a brief but excellent review of this subject. The subsequent chapters deal mainly with the electronic properties of crystals, including energy band theory, transport theory, and electronic bonding.

Naturally, in a book of this nature many important details can only be hinted at, and many topics must be omitted altogether. Each reader will be able to choose some favorites from among the latter. However, the book can be recommended almost without reservation to anyone who has a good foundation in quantum mechanics as an excellent survey of the important ideas of modern solid state theory.

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New Books

Advances in Astronautical Sciences. vol. 4. Plenum Press, New York; Chapman and Hall, London, 1959. 460 pp. $8. This volume is a record of both special lectures and technical papers presented at the American Astronautical Society's fifth annual meeting, which was held in conjunction with the 125th meeting of the AAAS. The contents of the volume are "Space exploration and human welfare" (H. L. Dryden); pt. 1, "Upper atmosphere research and re-entry mechanics"; pt. 2, "Space vehicle design"; pt. 3, "Guidance and instrumentation"; pt. 4, "Satellite mechanics and space exploration"; pt. 5, "Rockets and satellites"; pt. 6, "Man's environment in space"; "The flight of the monkey in the joint Army-Navy biological experiment" (N. Barr); "Survival of terrestrial micro-organisms under simulated martian conditions" (J. D. Fulton); "On the relation of oxygen consumption to oxygen tension" (D. E. Beischer); "Atmosphere contaminants and their control" (G. J. Duffner).

Advances in Electronics and Electron Physics. vol. 11. L. Marton, Ed. Academic Press, New York, 1959. 534 pp. $15. Contents: "Recent advances in photoemission," P. Gorlich; "Parity nonconservation in weak interactions," R. M. Sternheimer; "Quantum efficiency of detectors for visible and infrared radiation," R. C. Jones; "Automatic data processing in the physical sciences," G. E. Barlow, J. A. Ovenstone, F. F. Thonemann; "Operational amplifiers," R. L. Konigsberg; "Radio telemetering," H. B. Riblet; "Electron diffraction structure analysis and the investigation of semiconducting materials," Z. G. Pinsker; "Secondary electron emission from solids," O. Hachenberg and W. Brauer.

Anatomy and Physiology. vol. 2. Edwin B. Steen and Ashley Montagu. Barnes and Noble, New York, 1959. 334 pp. Paper, $2.50.

Applications of the Theory of Matrices. F. R. Gantmacher. Translated and revised by J. L. Brenner, D. W. Bushaw, S. Evanusa. Interscience, New York, 1959. 326 pp. $9.

Atomic Energy in the Communist Bloc. George A. Modelski. Melbourne Univ. Press, Melbourne, Australia; Cambridge Univ. Press, New York, 1959. 226 pp. $5.50.

Canadian Cancer Conference. vol. 3. R. W. Begg, Ed. Academic Press, New York, 1959. 475 pp. $12. Contents: "Nucleic acids," "Genetics," "Viruses and tumors," and "Biology of cancer."

The Chemistry of Heredity. Stephen Zamenhof. Thomas, Springfield, Ill., 1959. 117 pp. $4.25.

Engineering Mechanics. Dwight F. Gunder and Derald A. Stuart. Wiley, New York; Chapman and Hall, London, 1959. 402 pp. $7.75.

Fundamentals of Electronics. F. H. Mitchell. Addison-Wesley, Reading, Mass., ed. 2, 1959. 271 pp. $6.50.

General Meteorology. Horace Robert Byers. McGraw-Hill, New York, ed. 3, 1959. 550 pp. $9.50.

Grass Productivity. André Voisin. Translated from the French by Catherine T. M. Herriot. Philosophical Library, New York, 1959. 367 pp. $15.

Inside the U.S. Patent Office. The story of the men, the laws, and the procedures of the American patent system. Harry Kursch. Norton, New York, 1959. 189 pp. $3.95.

An Introduction to Economic Reasoning. Marshall A. Robinson, Herbert C. Morton, James D. Calderwood. Brookings Institution, Washington, D.C., ed. 2, 1959. 346 pp. $3.

An Introduction to Medical Genetics. J. A. Fraser Roberts. Oxford Univ. Press, New York, ed. 2, 1959. 275 pp. $7.

Inventions, Patents, and Their Management. Alf K. Berle and L. Sprague de Camp. Van Nostrand, Princeton, N.J., 1959. 611 pp. $12.50.

Lectures in Theoretical Physics. vol. 1. Lectures delivered at the summer institute for theoretical physics, University of Colorado, Boulder, 1958. Wesley E. Brittin and Lita G. Dunham, Eds. Interscience, New York, 1959. 421 pp. $6.

Lehrbuch der Organischen Chemie. Paul Karrer. Thieme, Stuttgart, Germany, 1959 (order from Intercontinental Medical Book Corp., New York 16). 1077 pp. $14.30.

The Location of the Synthetic-Fiber Industry. A case study in regional analysis. Joseph Airov. Technology Press of Massachusetts Inst. of Technology; Wiley, New York; Chapman and Hall, London, 1959. 215 pp. $9.75.

The Magnetodynamics of Conducting Fluids. Daniel Bershader. Stanford Univ. Press, Stanford, Calif., 1959. 153 pp. $4.50.

Methods of Experimental Physics. vol. 6, *Solid State Physics.* pt. A, *Preparation, Structure, Mechanical and Thermal Properties,* 482 pp., $11.80; pt. B, *Electrical, Magnetic, and Optical Properties,* 430 pp., $11. K. Lark-Horovitz and Vivian A. Johnson, Eds. Academic Press, New York, 1959.

Modern Adventures under the Sea. Patrick Pringle. Watts, New York, 1959. 240 pp. $3.95.

Men and Atoms. The discovery, the uses, and the future of atomic energy. William L. Laurence. Simon and Schuster, New York, 1959. 315 pp. $4.50.

Our Mineral Resources. Charles M. Riley. Wiley, New York; Chapman and Hall, London, 1959. 348 pp. $6.95.

The Nature of Reading Disability. Donald E. P. Smith and Patricia M. Carrigan. Harcourt, Brace, New York, 1959. 157 pp. $6.

Notes on the Quantum Theory of Angular Momentum. Eugene Feenberg and George Edward Pake. Stanford Univ. Press, Stanford, Calif., 1959. 56 pp. Paper, $1.25.

Pediatric Pathology. Daniel Stowens. Williams & Wilkins, Baltimore, 1959. 689 pp. $20.

Physics, an Exact Science. Harvey E. White. Van Nostrand, Princeton, N.J., 1959. 608 pp. $5.96.

Principles of Human Pathology. Edward B. Smith, Parker R. Beamer, Frank Vellios, Dale M. Schulz, Oxford Univ. Press, New York, 1959. 134 pp. $15.

Principles of Mechanics. John L. Synge and Byron A. Griffith. McGraw-Hill, New York, ed. 3, 1959. 569 pp. $9.50.

Principles of Physical Chemistry. William H. Hamill and Russell R. Williams, Jr. Prentice-Hall, Englewood Cliffs, N.J., 1959. 617 pp. $8.75.

Progress in Cryogenics. vol. 1. K. Mendelssohn, Ed. Academic Press, New York, 1959. 267 pp. $11.

Progress in Drug Research. vol. 1. Ernst Jucker, Ed. Birkhäuser, Basel, Switzerland, 1959. 607 pp. Fr. 68.

Progress in Neurobiology. vol. 4, *The Biology of Myelin.* Saul R. Korey, Ed. Harper, New York, 1959. 429 pp. $9.50. This symposium was supported by the National Institute of Neurological Diseases and Blindness.

Quantum Chemistry Integrals and Tables. James Miller, John M. Gerhauser, F. A. Matsen. Univ. of Texas Press, Austin, 1959. 1125 pp. $15.

Readings in Urban Geography. Harold M. Mayer, and Clyde F. Kohn, Eds. Univ. of Chicago Press, Chicago, Ill., 1959. 632 pp. $8.50.

Relativity for the Layman. A simplified account of the history, theory, and proofs of relativity. James A. Coleman. Macmillan, New York, 1959. 137 pp. $3.50.

Space Handbook. Astronautics and its applications. Robert W. Buchheim *et al.* Random House, New York, 1959. 346 pp. $3.95.

Virus Hunters. Greer Williams. Alfred A. Knopf, New York, 1959. 516 pp. $5.95.