done in isolation by passing numerical price and quantity bids back and forth via the experimenter until the contestants are satisfied with the bargain achieved.

The hypotheses tested by these laboratory experiments centered around the case of equal bargaining strength, the theoretically indeterminate case. The main hypothesis, that contracts negotiated under simulated, bilateral, monopoly conditions will tend to the quantity which maximizes joint payoff, was confirmed. By varying cost and revenue functions, the generality of the result was established. It was further shown that personal characteristics of the bargainers enter heavily into the determination of differential payoff and price. The variability of contracts around the maximum joint payoff appears to be controlled by the amount of information the bargainers have. Results are reported for the complete-complete, incomplete-complete and incomplete-incomplete information cases.

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Third Ur Kingdom Archives

Sumerian Economic Texts from the Third Ur Dynasty. A catalogue and discussion of documents from various collections. Tom B. Jones and W. Snyder. University of Minnesota Press, Minneapolis, 1961. 421 pp. Illus. $10.

Administrative and economic texts from the archives of the third Ur kingdom (end of the 3rd millennium B.C.) already published are approaching the 15,000 mark, but a large number in public and private collections all over the world remain unpublished. And, of course, complete archives from the same period are probably still buried in the sands of southern Iraq. This extraordinary wealth of source material, unmatched by that of any other period of antiquity, is nevertheless difficult to digest: the large number of texts, the dispersion of the publications (some of them rather inadequate), the large amount of necessarily tedious preparatory work, and last but not least the language difficulties have until now prevented the preparation of a reasonably complete synthesis useful to historians of economics and technology.

The present volume represents a contribution towards that goal, without intending to be in any way a complete exposition of the available material. The catalog comprises 354 new pieces, most of them from the collection of the Rosicrucian Egyptian, Oriental Museum in San José, California; the others are from eight or nine different public and private collections. The texts are given in transliteration only, except for a few copies of difficult cuneiform passages. A good deal of attention was given to presenting the individual texts as clearly as possible (see, for example, the tables accompanying No. 78). The commentary consists of 11 independent chapters on selected points touching not only on the texts presented by the authors but also on questions arising from the whole corpus concerned with the third Ur dynasty; the reconstruction of the prosopography and administrative frame of Drehem will be specially welcome for future research. A useful bibliography, intended to supplement the one given by Oppenheim in his catalog of the Eames collection (still the most informative and well-balanced work in this field), and comprehensive indexes complete the book.

However the synthesis of all Ur III material is yet to be made, and basic questions remain unanswered: Is the available material a representative sample of the economic life of the period? Which sectors of this economic life are represented and which are excluded? As is true of all reconstructions, we must first study carefully the limitations of our material to avoid unjustified extrapolations and the abuse of the arguments *ex silentio*.

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Computer Technology

Digital Applications of Magnetic Devices. Albert J. Meyerhoff and others, Eds. Wiley, New York, 1960. xix + 604 pp. Illus. $14.

In the computing industry the magnetic core has become the accepted device for large-scale storage of information because of its high reliability even under adverse conditions, its high speed capabilities, and its low energy expenditure. Most of the cores in digital computer systems are used for high-speed memory; however, they are also employed as logical circuit elements. The present text is mainly devoted to the latter applications. Much of the material is available in appropriate journals in less complete form; some of the topics have been considered in more general texts, but not as comprehensively as in this treatment. The editors have performed a very useful service in providing a one-volume, systematic treatment of an important field of digital technology.

The book, a reference text in the field of digital magnetic circuits, emphasizes the utilization of magnetic core circuits in the implementation of logical functions in digital systems. Although it consists of chapters written by 25 active workers from six industrial organizations, the volume is a well-organized and well-edited, unified presentation. Following the first part which discusses the fundamentals of magnetic core circuit technology, the six remaining parts cover particular areas of application. Each part consists of an introductory chapter explaining the general philosophy of the devices under consideration and of chapters discussing detailed circuit design, logical design, and systems design. Many references are cited, and the index is well prepared and complete.

The treatment of subject matter is, on the whole, clear and understandable. The section devoted to magnetic core memories is limited in scope to systems design. The editor justifies his position by stating that the existing literature covering this area is more extensive than that covering the topics he chose to elaborate on, but I feel that more could have been written here. The book should provide the digital systems designer with a set of digital techniques which have proven to be useful and reliable.

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Reprints

A Course of Analysis. E. G. Phillips. Cambridge Univ. Press, New York, 1960. 369 pp. Illus. $2.95.

Culture Methods for Invertebrate Animals. Paul S. Galtsoff *et al.* Dover, New York, 1961, 522 pp. Illus. $2.75. Prepared by American zoologists under the direction of a committee of AAAS Section F. Contains 313 articles covering 17 phyla. First published in 1937.

The Dynamical Theory of Sound. Horace Lamb. Dover, New York, ed. 2, 1960. 315 pp. Illus. $1.50.

Elements of Projective Geometry. Luigi Cremona. Translated by Charles Leudesdorf. Dover, New York, ed. 3, 1960. 322 pp. Illus. $1.75.

Flowering Earth. Donald Culrosss Peattie. Viking, New York, 1961. 252 pp. Illus. $1.45.

Nature and Man's Fate. Garret Hardin. New American Library, New York, 1961. 320 pp. Illus. $0.75.

Optics and Optical Instruments. An introduction with special reference to practical applications. B. K. Johnson. Dover, New York, 1960. 224 pp. Illus. $1.65.

Reflections on the Motive Power of Fire, Sadi Carnot. **And Other Papers on the Second Law of Thermodynamics**, E. Clapeyron and R. Clausius. E. Mendoza, Ed. Dover, New York, 1960. 174 pp. Illus. $1.50. "Memoir on the Motive Power of Heat" by Clapeyron was translated for this edition; "On the Motive Power of Heat . . ." by R. Clausius, translated by W. F. Magie, was originally published in *The Second Law of Thermodynamics* (Harper, New York, 1899).

Science and Common Sense. James B. Conant. Yale Univ. Press, New Haven, Conn., 1961. 356 pp. $1.45.

The Story of Alchemy and Early Chemistry. John Maxson Stillman. Dover, New York, 1960. 579 pp. $2.45.

Ternary Systems. Introduction to the theory of three component systems. G. Masing. Translated by B. A. Rogers. Dover, New York, 1960. 173 pp. Illus. $1.45.

The Theory of Equations. With an introduction to the theory of binary algebraic forms. vols. 1 and 2. William Snow Burnside and Arthur William Panton (vol. 2 edited by M. W. J. Fry). Dover, New York, 1960. 294 pp.; 328 pp. Illus. $1.85 each.

Theory of Maxima and Minima. Harris Hancock. Dover, New York, 207 pp. Illus. $1.50.

Toward Modern Science. vol. 1, *Studies in Ancient and Medieval Science,* 284 pp.; vol. 2, *Studies in Renaissance Science,* 222 pp. Robert M. Palter, Ed. Noonday Press (Farrar, Straus and Cudahay), New York, 1961. Illus. Paper, $1.95 each.

A Treatise on the Calculus of Finite Differences. George Boole. J. F. Moulton, Ed. Dover, New York, ed. 2, 1960. 348 pp. $1.85.

A Treatise on the Differential Geometry of Curves and Surfaces. Luther Pfahler Eisenhart. Dover, New York, 1960. 488 pp. Illus. $2.75.

Turning Points in Physics. A series of lectures that were given at Oxford University during Trinity term, 1958. R. J. Blin-Stoyle *et al.* Harper, New York, 1961. 192 pp. $1.45.

Voices of the Industrial Revolution. Selected readings from the liberal economists and their critics. John Bowditch and Clement Ramsland, Ed. Univ. of Michigan Press, Ann Arbor, 1961. 207 pp. $1.65.

Weight-Strength Analysis of Aircraft Structures. F. R. Shanley. Dover, New York, ed. 2, 1960. 417 pp. Illus. $2.45.

Miscellaneous Publications

(Inquiries concerning these publications should be addressed not to Science, *but to the publisher or agency sponsoring the publication.)*

Geophysics Research Papers. No. 69, "Line widths of pressure broadened spectral lines," C. J. Tsao and B. Curnutte, 94 pp. **Guenter Loeser Memorial Lectures**: 1956, "Phenomenological considerations of the interruption theory of line broadening," Robert G. Breene, Jr., 12 pp.; 1957, "Progress and prospects of radar meteorology," David Atlas, 33 pp.; 1959, "The detection of nuclear explosions by seismic means," Norman A. Haskell, 24 pp. Geophysics Research Directorate, Air Force Cambridge Research Laboratories, Bedford, Mass.

Glossary of Terms Frequently Used in Acoustics. Compiled by Horace M. Trent and Betty Anderson. American Inst. of Physics, New York, 1961. 44 pp. Prepared for use at a seminar for science writers held in San Francisco. The glossary is based on the American Standards publication *Acoustical Terminology*.

Instituto Geológico. *Memorias y Comunicaciones*, vol. 17, "Les Faunes des mollusques continentaux reparties dans le sud-est de l'Espagne entre le Miocene Superieur et le Quaternaire." Paul Jodot. Consejo Superior de Investigaciones Científicas, Barcelona, Spain, 1958. 143 pp. Plates.

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The Periodical Literature of Physics. A handbook for graduate students. American Inst. of Physics, New York, 1961. 15 pp. Prepared to assist students in finding the material they need, particularly in research journals.

The Provision of Animals for Cancer Research. Laboratory Animals Centre, Carshalton, Surrey, England, 1960. 116 pp. 12s. 6d. Fourteen papers read at the 1960 symposium.

Radio and Television. A selected bibliography. Patricia Beall Hamill. U.S. Office of Education, Washington, D.C., 1960 (order from Supt. of Documents, GPO, Washington 25). 46 pp. $0.25. A revision of the Office of Education's *Radio and Television Bibliography*.

The Radiochemistry of Beryllium. Publ. 3013. A. W. Fairhall. National Acad. of Sciences–National Research Council, Washington, D.C., 1960 (order from Office of Technical Services, Department of Commerce, Washington 25, D.C.). 58 pp. $0.75.

Recent Land and Ground-Water Development in Utah under the Desert Land Act. An economic appraisal. Bulletin 418. Clyde E. Stewart. Utah State Univ., Logan, 1960. 36 pp.

Report of the Institute of Industrial Science. vol. 8, No. 6, "Experimental studies on color aerial photographs in Japan," 34 pp.; vol. 10, No. 1, "On the study and application of infrared aerial photography," 19 pp. Takakazu Maruyasu and Motomitsu Nishio. Univ. of Tokyo, Tokyo, Japan, 1960.

Report on Scientific Research in Indonesia. Bulletin 2. Richard J. Russell. Council for Sciences of Indonesia, Djakarta, 1960. 74 pp. The results of a survey conducted between October 1959 and January 1960 to obtain suggestions for developing the council's program.

The Science Doctorates of 1958 and 1959. Their numbers, characteristics, and employment. Prepared by the National Academy of Sciences–National Research Council. National Science Foundation, Washington 25, 1960 (order from Supt. of Documents, GPO, Washington 25). 28 pp. $0.25. In 1959, 5300 science doctorates were awarded: chemistry, 1062; psychology, 811; engineering, 705; physics, 522; and mathematics, 301. The average age of the new doctorate holder was 31½ years.

Strontium 90 in Human Diet in the United Kingdom, 1959. Report No. 3. Radiobiological Laboratory, Agricultural Research Council. Her Majesty's Stationery Office, London, 1960 (order from British Information Services, New York 20). 68 pp. $0.70. The report concludes that "There is . . . considerable evidence that strontium 90, which has hitherto been released into the atmosphere, has already exerted its major effect; decreasing levels in human diet may therefore be expected in the future."

Survey on the Main Trends of Inquiry in the Field of the Natural Sciences, the Dissemination of Scientific Knowledge and the Application of Such Knowledge for Peaceful Ends. Pierre Auger. United Nations Economic and Social Council, Paris, 1960. 445 pp. Mimeographed.

Teaching by Television. A report. Fund for the Advancement of Education. Ford Foundation, New York, ed. 2, 1961. 87 pp.

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Transactions of the San Diego Society of Natural History, vol. 12. No. 26, pp. 421–440, "Inherent and applied camouflage in the subfamily Gememetrinae (Lepidoptera), including three new life history studies," John Adams Comstock. No. 27, pp. 441–448, "Differentiation of the southwestern tortoises (genus *Gopherus*), with notes on their habits," Chapman Grant. San Diego Society of Natural History, San Diego, Calif., 1960.

Trends in Juvenile Delinquency. Public Health Paper No. 5. T. C. N. Gibbens. World Health Organization, Geneva, Switzerland, 1961. 56 pp. $0.60.

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