SCIENCE

27 September 1968
Vol. 161, No. 3848

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

Index Issue

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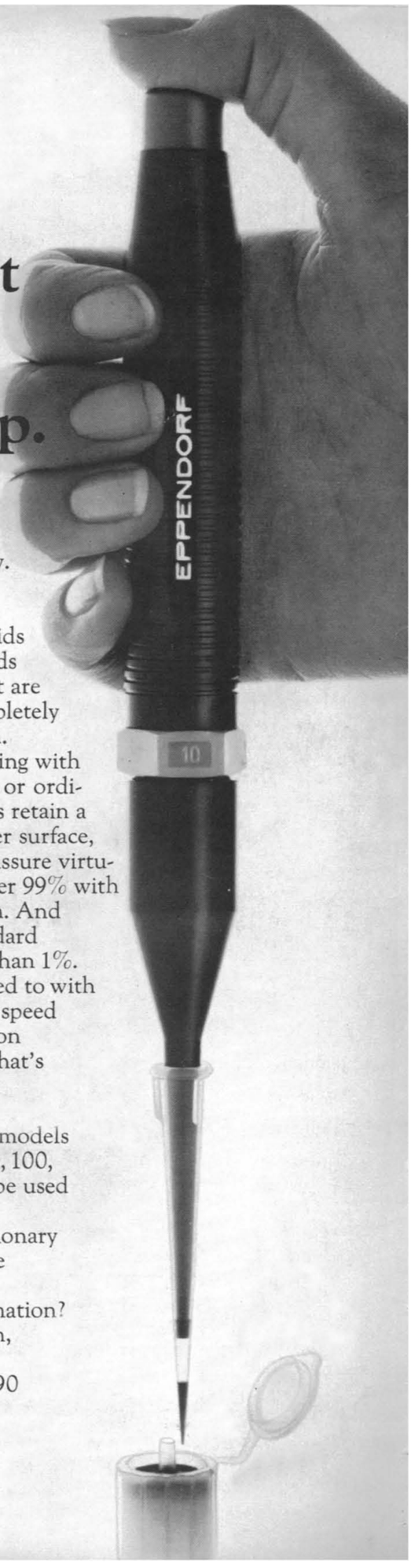

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AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COVER

Emperor Frederick II of Hohenstaufen (1194–1250) and young Conrad (1228–1254) setting forth upon a hawking expedition, as shown in the Manesse Manuscript at Heidelberg, 14th century. Frederick, King of Sicily and Emperor of the Holy Roman Empire, compiled his personal observations and interpretations of falconry and ornithology in *De arte venandi cum avibus*. See page 1298. [Universitätsbibliothek, Heidelberg, Germany]

2 NEW AAAS SYMPOSIUM VOLUMES

• Biology of the Mouth • Folk Song Style and Culture

Biology of the Mouth

Editor: Philip Person, Chief, Special Research Laboratory for Oral Tissue Metabolism, Veterans Administration Hospital, Brooklyn.

320 pp., electron micrographs and other illustrations, bibliog., index, 1968.

Price: $10.00. AAAS members' cash orders: $8.75.

A collection of comprehensive, multidisciplinary articles dealing with problems of the biology of the mouth and of oral disease and also the borderlands where fundamental approaches and investigations in physics and chemistry relate to, and can be brought to bear on, such problems. Among the disciplines represented are comparative anatomy and histology (light and electron microscopy), comparative molecular biochemistry, anthropology, paleontology, neuroanatomy and neurophysiology, zoology, botany, solid-state physics, and chemical physics. An attempt is made to integrate these varied contributions, to provide a broad perspective in which important mutual interests are identified and explored. This perspective includes the classical disciplines of Darwinian biology and the more recent disciplines of molecular and quantum biology, as well as their relationships to diseases of the mouth and oral structures. A feature of the volume is a highly original and significant contribution by Professor J. Z. Young dealing with the influence of the mouth upon the evolution of the brain.

Contents

Foreword: Place of Dentistry in Science.

Biology of Oral Tissues and Oral Disease: Darwin and Quantum.

Influence of the Mouth on the Evolution of the Brain.

Bone, Dentin, and Enamel and the Evolution of Vertebrates.

Tooth and Jaw in the Assessment of the Origins of Man.

Cleaning Symbiosis and Oral Grooming on the Coral Reef.

Lactoperoxidase, the Peroxidase in the Salivary Gland.

Biochemical Processes in Macromolecular Environments: Plant Cell-Wall Matrix in Lignin Polymer Foundation.

A Physicist Looks at Biology.

Role of Water in Some Biophysical Properties of Skeletal Tissues.

Biological Significance of Water Structure.

Water and Electrolyte Balance in Cells and Tissues.

Molecular Evolution of Connective Tissue.

Comparative Ultrastructure and Organization of Inorganic Crystals and Organic Matrices of Mineralized Tissues.

Folk Song Style and Culture

A Report on Cantometrics by the Staff of the Cantometrics Project of Columbia University, Alan Lomax, Project Director.

384 pp., 80 illus., 87 tables, bibliog., index, 1968.

Price: $16.75. AAAS members' cash orders: $14.50.

Working with a large sample of recorded songs and filmed dances from all culture areas of the world, the Cantometrics Project has discovered some of the ways in which song and dance style vary by culture area. Strong statistical relationships have been established between a set of basic factors of social and economic structure and performance style. The book reports on an imaginative yet rigorous exploration of the paralinguistic and parakinesic realms and a thoroughgoing test of the hypothesis that factors of cultural style are primary forces in shaping all human behavior. Performance style here becomes a psychocultural indicator, and, for the first time, the social and cultural import of the expressive act is firmly established.

Contents

The Stylistic Method; The Cantometrics Experiment; The Cantometric Coding Book; The World Song Style Map.

Consensus on Cantometric Parameters: A. Consensus Testing; B. The Paralinguistic Framework.

Song as a Measure of Culture; Social Solidarity; Self-Assertion, Sex Role and Vocal Rasp; Effects of Infantile Stimulation on Musical Behavior.

Dance Style and Culture; Choreometric Profiles; The Choreometric Coding Book; Folk Song Texts as Culture Indicators; Cantometrics in Retrospect.

Appendixes: Data Systems and Programming; Statistical Notes; Summodal Profiles for Nine World Song Style Regions.

Bibliography. Folk Song Text Sources. Film Sources.

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rights to elaborate the new structures, to discuss them with the new board of directors, and to perform transitional duties until the new faculty is instituted in February 1969. Broad participation by the academic community in faculty and university decision-making will be emphasized and representatives from the student body and the entire teaching and nonteaching staff will be elected to the faculty and board of directors. These representatives will have full voting rights.

Efforts are also being made to reduce the omnipotence of the "chairs," a power alluded to by Richelle (Letters, 19 July). The intention is to emphasize collegiate responsibilities and prevent the accumulation of power by any single individual through the acquisition of numerous academic titles or by virtue of sheer seniority (*1*).

The University of Brussels is the only private nonreligious institution of its kind in Belgium. Although this setting may appear to be progressive, it does not follow that the academic staff is unanimously enthusiastic with the projected reforms since they were begun last May. Those faculty members who do endorse them might look for some more student support during the transitional period in the next few months.

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Reference

1. R. C. Fox, *Science* **136**, 476 (1962).

Falconry

Doolittle's tribute to Frederick II, the eminent and early natural scientist (Letters, 2 Aug.), will be applauded by ornithologists universally. Frederick II was a student of Aristotle and other classical scholars, an excellent observer of nature, and a keen falconer. His life work *De arte venandi cum avibus* is available in English as *The Art of Falconry*, translated by C. A. Wood and F. M. Fyfe (Stanford University Press, Stanford, California, 1943). This is an excellent textbook of falconry and a general review of ornithology which covers a wide range of subjects including migration, general ecology, food, anatomy, molt, and flight. Many of these subjects are discussed in a complete form which was not surpassed until the modern period of ornithology. This work places Frederick II in the honored position as the first great ornithologist in history, according to Stresemann (*Die Entwicklung der Ornithologie*, Verlag Hans Linberg, Aachen, 1951), in addition to his achievement of being the first sovereign known to present a biological work under his name.

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Liberals' Common Sense

Clark's denunciation of liberals for their alleged betrayal of the principle of free speech is uncalled for and misses the point completely (Letters, 5 July). If I may be allowed to paraphrase his example, it might read like this:

"There is a fire burning over there, we have no water, do you suppose we could put it out by dumping that tank car of kerosene on it?"

Shockley: "I dunno—let's find out."

Liberals: "Don't try it now; let's wait and try it under safe conditions in the laboratory."

Whether or not there are racial differences in intelligence is a legitimate subject for scientific investigation; no one is disputing that fact. It is the use to which the results of such studies are put that is objectionable. Surely Clark must be aware of the propaganda of racist organizations, hence there is no need to detail it here.

Even if the results of such a study show that the Negro is inferior in intelligence, these results would have no relevance to our present problems. Intelligence has never been a criterion for full, first-class citizenship for whites, and Negroes should not be asked to come with I.Q. cards in hand to apply for those rights. Just because we are liberals, we are under no obligation, moral, or ethical, or in the name of free speech, to furnish a platform for Shockley, or for anyone else. Liberals' responsibility to their community and their country far transcends any fancied responsibility they owe to Shockley. Liberals should have common sense. Common sense and courage were in evidence at the Brooklyn Polytechnic Institute, and I, for one, commend them for it.

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617 Highland Avenue, Newark, New Jersey 07104

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Physical Fitness

Despite advances in medical research and practice, life expectancy in the United States is not changing much. Benefits of improved practice are being counterbalanced by effects of deleterious living patterns. Heart disease, the number one killer, is increasing. Contributing heavily are such controllable factors as sedentary living, obesity, and excessive cigarette smoking. The Framingham [Massachusetts] Study has identified many factors contributing to heart disease. In one of its contributions (*1*) it examined the role of physical activity. The most sedentary individuals had a mortality from coronary heart disease five times that of individuals who were active. Frank and his colleagues (*2*) in New York have studied coronary heart disease occurring in a defined population of 110,000 men and women. They have noted that the incidence of rapidly fatal myocardial infarction among sedentary individuals who are smokers is nine times the incidence among physically active nonsmokers of similar age.

Physicians have long recommended physical fitness, including weight control, but the admonitions usually were not accompanied by realistic prescriptions. A physiological way to reduce weight is to eat a balanced diet representing a modest caloric deficit with respect to ordinary needs and to attain a substantial caloric deficit through exercise. By this means weight losses of 1 to 2 pounds a week can be achieved comfortably. Two recently issued paperback books (*3*, *4*) give simple, effective programs of exercise for improving physical fitness. These books emphasize the great importance of conditioning the cardiovascular system. The value of isometrics is questioned, and calisthenics are assigned a secondary role.

The cost, in time and effort, of achieving fitness is small. Not more than an hour or two a week of effort is required, split among three or more occasions. In 16 weeks or less, sedentary individuals can note profound changes in their physical condition. For example, the resting pulse rate may be lowered from 85 to 65 beats per minute, and the time required to go a mile may be cut from 12 minutes to about 8.

Two cautionary bits of advice seem indicated. It is well to have a physical checkup before expanding one's activity. In the conditioning process one should "train, not strain." The programs begin with easy tasks—for example, 1 mile of walking—and then progress to more exacting efforts as fitness improves. The recommended means for maintaining fitness is jogging or running. However, other activities, such as cycling or swimming, also are effective. The relative benefits of the various forms of exercise are discussed by Cooper (*4*).

As one result of the conditioning process, the heart becomes much more efficient. Åstrand (*5*) has remarked that, by expending a "total of some 2,000 extra heart beats during a day's training, you save 10 to 30,000 beats over the remainder of the day."

An important potential benefit from physical fitness is an improvement in mental attitude. The typical middle-aged sedentary individual is in effect crawling submissively toward the grave. By investing an hour or two a week, he may add years to his useful life. He can become a better athlete than many who are 20 to 30 years younger. Buoyed by pride and a sense of well-being, he can compete more confidently in intellectual areas.—PHILIP H. ABELSON

1. W. B. Kannel, in *Proc. Int. Symp. Physical Activity and Cardiovascular Health, Toronto, 1966* (1967) [available from the Ontario Heart Foundation, 247 Davenport Rd., Toronto 5, Canada. $3].
2. C. W. Frank, *J. Amer. Med. Ass.* **198**, 1241 (1966).
3. W. J. Bowerman and W. E. Harris, *Jogging* (Grosset & Dunlap, New York, 1967).
4. K. H. Cooper, *Aerobics* (Grosset & Dunlap, New York, 1968).
5. P. O. Åstrand, in *Proc. Int. Symp. Physical Activity and Cardiovascular Health, Toronto, 1966* (1967).

AAAS activities: Council, 1958–; Congressional Science Seminar Lecturer, 1962.

Gordon K. Teal

Gordon K. Teal, 61 (chemistry), research associate, Columbia University, 1932–35; research physical scientist, Bell Telephone Laboratories, 1930–53; assistant vice president, Texas Instruments Incorporated, 1953–64, director of materials and components research, 1953–54, director of Research Division, 1954–57, director of research, 1957–61, director of research and engineering, 1961–62, international technical director, 1963–64; director, Institute for Materials Research, National Bureau of Standards, 1965–67; assistant vice president in charge of technical development, Equipment Group, Texas Instruments Incorporated, 1967–; American Chemical Society tour speaker, 1952, 1953, and 1954; National Academy of Sciences–National Research Council: Panel on Selenium, 1956, Panel on Semiconductors, 1957, Materials Advisory Board, 1960–64; Materials Panel of Advisory Group on Electronic Parts, Office of the Assistant Secretary of Defense, 1956–59; Institute of Radio Engineers: Editorial Board, 1958–61, director, 1959, director-at-large, 1962; president, Texas Academy of Science, 1960; chairman, Executive Technical Development Board, Polytechnic Institute of Brooklyn, 1963–; Outstanding Alumnus Award, Baylor University, 1964; 1966 Inventor of the Year Award, Patent, Trademark and Copyright Research Institute, George Washington University; Medal of Honor, Institute of Electrical and Electronics Engineers, 1968.

AAAS activities: Committeeman-at-large, Section on Industrial Science (P), 1968–71; Council, 1968–71.

Clarke Williams

Clarke Williams, 66 (nuclear engineering, physics), assistant engineer, New York Central Railroad, 1925–26; assistant in physics, Columbia University, 1926–30; instructor in physics, City College of New York, 1930–44, assistant professor, 1944–48; assistant chairman, Nuclear Reactor Group, Brookhaven National Laboratory, 1946–51, associate chairman, Reactor Science and Engineering Department, 1951–52, chairman, Nuclear Engineering Department, 1952–62, deputy director, 1962–; scientific staff, Office of Scientific

Research and Development (Columbia University), 1941–44; group leader, Manhattan Project (Carbide and Carbon Chemical Company), 1944–46; senior scientist, Los Alamos Scientific Laboratory, 1947–48; New York State Advisory Committee on Atomic Energy, 1956–59; American Nuclear Society: Board of Directors, 1957–60, National Program Committee, 1957, chairman, Planning and Coordination Committee, 1957–58, Education Committee, 1960, vice president, 1962, president, 1963–64, director of publications, 1965–67; Board of Directors, Skills Unlimited, 1962–; General Advisory Committee on Atomic Energy, New York State, 1966–; Subcommittee on Oceanography, Nassau–Suffolk Bi-County Planning Board; Atomic Safety and Licensing Board Panel, Atomic Energy Commission, 1967–; Board of Trustees, Williams College, 1967–; Committee on Radioactive Waste Disposal, National Academy of Sciences, 1968–.

AAAS activities: Council, 1967–.

Frank Bradshaw Wood

Frank Bradshaw Wood, 52 (astronomy), research associate, Princeton University, 1946; National Research Council fellow, Steward Observatory, University of Arizona, and Lick Observatory, University of California, 1946–47; assistant professor and assistant astronomer, Steward Observatory, University of Arizona, 1947–50; associate professor to Flower professor, University of Pennsylvania, 1950–68, executive director, Astronomical Observatories, 1950–54, director, 1954–68; professor and director, Optical Astronomical Observatories, University of Florida, 1968–: ensign to lieutenant commander, U.S. Naval Reserve (active duty), 1941–46; Fulbright research scholar, Mount Stromlo Observatory, 1957–58; visiting professor, American Astronomical Society, 1959–; Council, American Astronomical Society, 1958–61; International Astronomical Union: Organizing Committee and chairman, Committee on Cooperative Observational Programs, Commission 42, 1961–67, secretary, Commission 38, 1964, 1967, president, Commission 42, 1967–.

AAAS activities: Secretary, Section on Astronomy (D), 1958–69; Council, 1958–69; Committee of Judges, AAAS-Newcomb Cleveland Prize, 1961–63; Committee on Council Affairs, 1961–64.