through Ctenophora (McGraw-Hill, New York, 1940) in most respects. Some authors [for example, R. E. Blackwelder, *Classification of the Animal Kingdom* (Southern Illinois University, Carbondale, 1963)] divide the Aschelminthes into several phyla and separate additional phyla from the Arthropoda and Chordata.

93. Branch Mesozoa, Hyman (*92*); branch Agnotozoa, R. C. Moore, C. G. Lalicker, A. G. Fischer, *Invertebrate Fossils* (McGraw-Hill, New York, 1952); subkingdom Agnotozoa, Moore (*9*).
94. Phylum Parazoa, W. J. Sollas, *Quart. J. Microscop. Sci.* **24**, 603 (1884).
95. W. G. Kükenthal and T. Krumbach, *Handbuch der Zoologie* (de Gruyter, Berlin, 1923–5).
96. Animalia radiata of G. Cuvier, *Le règne animal distribué d'après son organisation* (Déterville & Crochard, Paris, 1816) with narrowed content; grade Radiata, Hyman (*92*); phylum Coelenterata of authors.
97. Heteraxonia or Bilateria of B. Hatschek, *Lehrbuch der Zoologie* (Fischer, Jena, 1888); grade Bilateria of Hyman (*92*).
98. W. Schimkewitsch, *Biol. Zentralbl.* **11**, 291 (1891).
99. T. H. Huxley, *Quart. J. Microscop. Sci.* **15**, 52 (1875).
100. This is a contribution from the Department of Population and Environmental Biology, University of California, Irvine. I thank friends at Irvine and elsewhere for comments.

NEWS AND COMMENT

National Data Bank: Its Advocates Try To Erase "Big Brother" Image

The computer, for all its promise and achievements as a tool of modern technology, is viewed with distrust by many people who have considered its implications for personal privacy. They are uneasy at the possibility that someday, perhaps well before 1984, there will exist a master computer center, a Big Brother, with voluminous and instantly retrievable data on every American who has lived long enough to get a social security number, a traffic ticket, or even a birth certificate, or a report card from school. The fact that private credit-rating bureaus and insurance investigators already have dossiers on tens of millions of Americans itself gives substance to these fears and is beginning to receive attention from Congress. However, insofar as the computer and personal privacy is concerned, the question which has received the most congressional attention to date is that of whether the United States government should establish a statistical data center or "national data bank."

Such a data center—first proposed in 1965 by a committee of the Social Science Research Council, a nongovernmental group, and later endorsed by a government task force—would be intended to serve, not investigators seeking information about individual persons, but, rather, scholars and other users of gross statistics. One of its principal aims would be to help economists, other social scientists, and government specialists investigate major economic and social problems, such as those of persistent unemployment and social disorganization in the big-city slums.

A score of federal agencies, such as the Census Bureau, the Internal Revenue Service, and the Social Security Administration, collect data of various kinds. The national data center would store the more statistically significant data collected by these agencies, and, as required for special studies, data from two or more agencies would be matched up and integrated. In a study of the causes of poverty, for example, it might be useful to have census data integrated with data obtained from the social security and internal revenue systems. Most social scientists who use federal statistics extensively probably support the data-bank concept, though there now appears to be a general belief that special efforts must be made to safeguard privacy.

Fearing that establishment of such a statistical center might lead to abuses, the House Government Operations Committee's Special Subcommittee on Invasion of Privacy held 3 days of hearings on the matter, in July 1966. The subcommittee, headed by Representative Cornelius Gallagher (D–N.J.), was concerned at some of the testimony of government witnesses, who said the data center could not integrate or update data from the collecting agencies without knowing the identities of individual persons.

Last August, the Gallagher subcommittee issued a report recommending that the "priority of privacy" be asserted in designing and setting up the data bank. The subcommittee suggested, through a series of questions, that the data center itself keep data largely in the aggregate and keep none on identifiable individuals. It recommended that the data bank not be set up in any existing federal agency, but that it be placed under its own supervisory commission and removed as far as possible from the political pressures of an incumbent administration.

These proposed safeguards reflected fears expressed by the subcommittee's lead-off witness, Vance Packard, author of *The Naked Society*, whom Gallagher credits with being one of the first Americans to warn that the computer poses a threat to privacy. In Packard's judgment there is a real danger that the efficiencies attainable through assembling more and more data in one place may prove irresistible, with the result that a data center designed as an innocuous tool for statisticians would become a kind of electronic Frankenstein's monster. "My hunch," Packard said, "is that Big Brother, if he ever comes to these United States, may turn out to be not a greedy power seeker, but rather a relentless bureaucrat obsessed with efficiency."

Although the Nixon administration might conceivably decide otherwise, the outgoing Johnson administration has concluded that, in view of the widespread mistrust of the national data bank concept, Congress should not be asked this year for authority to establish the data bank. According to Raymond T. Bowman, an assistant director of the Bureau of the Budget who is responsible for coordinating all federal statistical services, the administration's decision was to continue the interagency review of tentative plans for a data bank and to have those plans reviewed also by an advisory committee, its members to be made up of such people as constitutional lawyers, computer experts, businessmen suppliers of statistical data, and statistics users (Gallagher would also have the

Congress represented on the committee).

Until recently, Bowman has felt that expecting the data center to carry out its mission without knowing the identities of individuals contained in its files would be unrealistic and unnecessary. In his view, the Census Bureau's excellent record of respecting the confidentiality of its data (by law, the Census Bureau cannot release data about individuals, even to the FBI) should itself be reassuring to those who worry about Big Brother. There is no reason, he suggested, why a national data center, governed by appropriate laws and regulations, could not be expected to do as well as the Census Bureau has done. (Rules of confidentiality now vary from agency to agency, however; the Internal Revenue Service, for example, allows investigators from the Department of Justice and certain other agencies to examine an individual's tax return.)

Further, Bowman has said that privacy would be protected by excluding certain information from the center altogether. The categories excluded would cover such material as personnel records (letters of reference, test scores, and performance ratings, for instance), medical records, and dossiers compiled by the FBI. Moreover, according to Bowman, even the temptation to compile individual dossiers would be largely avoided by restricting data kept by the center to samples, although the center would be allowed to draw on more complete data in the files of other agencies.

Bowman and his associates insist that all or most of the foregoing safeguards would have, as a matter of course, figured in plans for a computer center, even if the Gallagher subcommittee had not made such a point of the privacy issue. Now, however, Bowman finally has come around to accepting the additional safeguard which the subcommittee has regarded as of critical importance—to deny the data center knowledge of the identities of individuals in its files. Although its capabilities would be limited somewhat by this safeguard, the center would be able to accomplish most of its objectives, Bowman believes. He would have the Census Bureau and other agencies match up and consolidate data for the data center. A weakness in this is that these agencies would themselves be functioning as data centers, but, inasmuch as it would mean less centralized control, the Gallagher subcommittee believes the safeguard would be meaningful.

Chairman Gallagher, though reserving

NEWS IN BRIEF

• **LAIRD NAMES SEAMANS:** Defense Secretary-designate Melvin Laird this week named Robert S. Seamans, Jr., to be Secretary of the Air Force in the Nixon Administration. Seamans, a professor of aeronautics at Massachusetts Institute of Technology since March 1968, served as deputy administrator of the National Aeronautics and Space Administration (NASA) from December 1965 to January 1968. Seamans, who was, in effect, NASA's general manager (*Science*, 27 Sept.), had joined NASA in 1960. As Secretary of the Air Force, Seamans succeeds Harold Brown, recently named president of California Institute of Technology.

• **SOVIET TIDAL POWER STATION:** The Soviet Union has announced the operation of its first experimental pilot tidal power station on the Arctic Ocean and its intention to build additional, more extensive tidal power plants in the future. The pilot station, which now has a 400-kilowatt turbine to generate power, is located on the Barents Sea, 50 miles from Murmansk near Finland.

• **COLUMBIA HOUSING:** Teacher's College at Columbia University has announced plans for a $59-million building program, including a housing development which will include poor families from the neighboring community. During university disruptions last spring, student critics charged the university with purchasing residential buildings for expansion and relocating poor families in unsatisfactory housing in distant areas of the city. College officials say that not less than 200 of some 1000 apartments in a 40-story tower will be reserved for community residents who will be charged low rents. The College plans to house graduate students and faculty in the remaining units. A library and new academic and research facilities are also included in the $59-million expansion project. Teacher's College, which has 5500 graduate students, has separate financing, but is affiliated with Columbia University.

• **FDA INTEREST IN SOVIET PILL REPORT:** The Food and Drug Administration is attempting to obtain a Soviet public health service report, which endorses the use of intrauterine devices (IUD's) in Soviet family planning programs and questions the safety of the oral contraceptive. The Soviet report indicates the Russian government plans to begin mass production of IUD's because a series of tests have shown them to be superior to the pill.

• **SCIENCE WRITING AWARDS:** Prizes of $1000 were awarded at the AAAS Dallas meeting to the three winners of the 1968 AAAS-Westinghouse Science Writing Awards. Walter Sullivan, science editor of the New York *Times*, won the award for science writing in newspapers with over 100,000 daily circulation for a series of ten articles on pulsars. John Hanchette, reporter for the Niagara Falls *Gazette*, won the award for newspapers with a circulation under 100,000 for a series on air pollution, and Tom Alexander, a *Fortune* associate editor, won in the magazine category for two articles on research on the nature of matter.

• **FAMILY PLANNING:** *Medical Handbook*, the standard clinical reference book of the International Planned Parenthood Federation (IPPF) on world family planning programs, contraceptive devices, medical clinical practices, and a bibliography of family planning publications, may be obtained for $2.50 (postpaid) from IPPF, 18-20 Lower Regent, London, S.W.1, England.

• **MED SCHOOL HOPEFULS:** A sharp rise in the number of medical school applicants is attributed to the change in draft requirements, which now limit first-year graduate school deferments to students in the medical health sciences. The number of medical school applicants for next year is about 26,000 compared with 22,288 last year, an increase of 16.7 percent. There are approximately 9700 places available in first-year classes. The American Association of Medical Colleges (AAMC) reports that the number of medical school applicants has risen steadily since draft deferments have become tighter. In 1968 the number of applicants rose to 22,288 from 19,706 in 1967, an increase of 13 percent. The AAMC says that in the years 1965–67 there was an increase of less than 1 percent in medical school applicants. The 1968 total enrollment in medical schools is about 35,700 students.

final judgment until he sees the Bureau of the Budget's proposals, told *Science* recently that he was "encouraged" by the bureau's rethinking of the safeguards question. He still believes that an independent commission should be set up to supervise the data bank continuously, instead of merely conducting periodic reviews of its operations and observance of safeguards, which is the role the Bureau of the Budget has in mind for such a commission.

The Gallagher subcommittee is a small, three-man group which in itself has little power; but it has been highly vocal, and, through its data-bank inquiry and its earlier investigation of personality testing, the subcommittee is now well identified with privacy issues. (Gallagher, though accused by *Life* magazine last August of having ties with mobsters —charges which Gallagher has denied and which are yet to lead to a grand jury indictment or any official censure —was reelected by his New Jersey constituents in November by a 63-percent majority.)

Accordingly, if the subcommittee goes along with the data-bank concept as now revised, this might brighten possibilities of Congress's authorizing a data center. Establishment of such a center under a system of privacy safeguards would be particularly significant if it led to a thorough review of the practices of all federal data-gathering agencies, including the Internal Revenue Service and the FBI.

Indeed, as Congress's Joint Economic Committee's statistics subcommittee, which favors the data-bank idea, observed in a 1967 report, establishment of the data center would "force a more explicit consideration of these pressing [privacy] issues [and] might cause us to move from the present ad hoc system to one of uniform and far-reaching principles." The Bureau of the Budget's positive response to the Gallagher subcommittee's demand for greater safeguards indicates that congressional consideration of the privacy issue has had a significant impact already.

—LUTHER J. CARTER

Education Research: Academy Cooperates in New Venture

The National Academy of Sciences (NAS) and the Office of Education (OE) are collaborating in a new program of basic research in education which, despite the stringencies of this year's budget, makes federal grant funds available to a broader research constituency.

OE, which until now has had little connection with the underwriting of basic research, is the new funding source. At OE's request, NAS, through its action arm, the National Research Council (NRC), in conjunction with the new National Academy of Education (NAE), has established in its behavioral sciences division a 13-member Committee on Basic Research in Education. The chairman is Patrick Suppes,* director of the Institute for Mathematical Studies in the Social Sciences at Stanford University.

Funds available for the new program amount to about $1 million. The source of the money is the approximately $20 million earmarked for project support in nearly $90 million budgeted for OE's Bureau of Research.

At this point the new committee is inviting researchers from a wide variety of disciplines to submit proposals for projects that "will contribute to fundamental knowledge and will deepen insight into critical problems in educational theory, policy and practice." These disciplines range through the biological, behavioral, and social sciences to such nonscientific fields as history and philosophy.

Emergence of the new program hardly means that OE has excess money to spend. Like all federal agencies concerned with R & D and social welfare programs, it is feeling the budgetary pinch this year as seldom before. The explanation for the shift in priorities lies in the peculiarities of the educational research field and the inclination of federal officials in recent years to move in new directions. Up until now, educational research has been largely the province of the professional educator, with a helping hand from the educational psychologists and the statisticians. Most of the research has been of a limited, applied nature. With a number of exceptions (Suppes's work in computer-assisted instruction is one), it enjoyed a scarcely towering reputation in the scientific community. Again with some notable exceptions, educational researchers have tended to talk only to each other and to OE, while OE has failed to build links with the most important fields of fundamental research. Consequently, few scientists have looked to OE as a likely source of funds or as a place of significant research action.

"We're hoping to draw to education as a site of inquiry the talents of a much wider array of disciplines than has been possible so far," explained Norman Boyan, who was named to head up OE's Bureau of Research a few months ago. Boyan readily concedes that OE does not have the expertise to ride herd on such a program. "We see the NAS–NAE committee as an effective screening group and as a way of providing sensible interaction between the various disciplines."

Suppes summed up his committee's purpose this way: "Until now there has not been a close relationship among the people who could conduct basic research in education. You have this kind of relationship in the health sciences, and NIH performs a key role there. What we'd like to do is stimulate something similar in the education field, to develop a broad base of support and activity for basic research in education."

OE's willingness to go in this direction began developing about 2 years ago under the leadership of Boyan's

* Other members of the committee are James S. Coleman (vice chairman), Johns Hopkins University; Ernest W. Caspari, University of Rochester; R. Taylor Cole, Duke University; Lawrence A. Cremin, Teachers College, Columbia; Bruce K. Eckland, University of North Carolina; John I. Goodlad, UCLA; Wayne H. Holtzman, University of Texas; Fritz Machlup, Princeton University; Arthur W. Melton, University of Michigan; Julius Richmond, Medical School, State University of New York, Syracuse; A. Kimball Romney, University of California, Irvine; Edgar H. Schein, M.I.T.