Russian and U.S. Science: Another View of the "Gap"

One of the elder statesmen of science last week deplored the productivity gap between American and Soviet science. But this time it was a Russian, Pytor Kapitsa, the 74-year-old director of the Institute of Physical Problems of the Soviet Academy, and it was his conclusion that the Soviets are running far behind. It was also his conclusion that Soviet basic laboratories should make room for bright young people by sending some of their deadwood to industry.

Writing on 20 January in *Komsomolskaya Pravda*, the Communist youth newspaper, Kapitsa said that if analyses recently performed in the U.S. are valid, "we must acknowledge the fact that we produce only one-half as much (in published research reports) as the U.S., while we have almost an equal number of people active in the field. We must also recognize," he continued, "that the productivity of our scientists is lower than that of the scientists in the U.S.A." Kapitsa did not cite the sources to which he referred, but they probably included the recent National Academy of Sciences report on chemistry, which compared national scientific output on the basis of quantities of published results (*Science*, 3 Dec. 1965).

To increase the productivity of Soviet science, he said, an increase in numbers alone is insufficient; the quality of scientific research must also be improved. "Obviously," he added, "it would be correct to send those who work inefficiently in science to industry where they could be of great use to the country. Of course, we cannot compromise industry. But such should be the tendency of improvement in our scientific endeavor. It would, for example," he went on, "be possible to transfer 15 to 20 percent of our staffs from science to industry every year and to take into research well-prepared and qualified youth. In this manner, we would improve the quality of the scientific staffs and also not close the door of science in the face of the young."

Kaptisa observed that the Americans "are seriously concerning themselves with the questions of the development of science in their country and the relationship between science and industry."

The United States, he said, has been stressing quality in the development of its scientific work force. "They consider that scientific work should receive even more money, but they do not have enough of that type of highly qualified people who are necessary to the direction and continued growth of science. Therefore, in the past few years, they have imported scientists from England and Western Germany. . . . Since the Americans have taken only the best people, it means that they have taken away the very best graduates from 50 European universities."

"One must not fear say," Kapitsa stated, "that in the past few years the scientific gap between our country and the U.S. has not been closed. It is therefore all the most important to seek a satisfactory remedy. To accomplish this, we must increase our scientific productivity, improve our instruction of industry in the use of scentific and technological advances. . . . I firmly believe that if we will not fear to speak the truth about our shortcomings, and if we will earnestly seek for correction of them, then our scientific productivity will soon regain its former record tempo and drive."

Announcements

Milligram quantities of about 300 **steroid compounds**, many of them unavailable commercially, are now available at no cost to U.S. scientists in biomedical research. The service is the result of an agreement between the National Institute of Arthritis and Metabolic Diseases and the Medical Research Council (MRC) of Great Britain, to give U.S. scientists access to the MRC steroid reference collection. The collection is intended to be a source of reference standards for biochemical work, and large amounts of steriods cannot be provided for macrochemical studies, nor will they be supplied for use as experimental drugs in human subjects.

Requests for samples or for further information should be sent to W. C. Alford, Room 225, Building 4, NIH, Bethesda, Maryland 20014. Requests should state the intended use of the compounds and should indicate, in milligrams, the minimum necessary for the proposed research. The samples will be mailed from England to the recipients.

The University of Kansas and the Universidad de Oriente (UDO), Venezuela, have begun a 2-year cooperative program to help the latter develop its school of **basic sciences.** The project will involve chemistry, physics, mathematics, and the biological sciences. It is expected to be of special interest to biologists because it will facilitate work at UDO's four campuses: Cumaná, in a dry coastal area; Puerto La Cruz, a moderately wet coastal area; Jusepín, which is inland and moderately dry; and Ciudad Bolívar, on the Orinoco River.

The University of Kansas has supplied faculty advisers to UDO and instructors to take the place of faculty members from the South American school who are now at Kansas completing their graduate training. Financial support is being given by the Ford Foundation and by the UDO. Additional information is available from the Project coordinator at Kansas, Daniel H. Janzen, College of Liberal Arts, Lawrence.

Pratt Institute, Brooklyn, recently announced plans for a **computer education center**. Initially the center will use existing facilities with additional equipment to be added as the need arises. Earlier this fall, the entire fac-

ulty of Pratt's engineering and science school took part in an intensive program of computer instruction to provide a basis for a complete computer orientation of all the school's curricula. A similar study is now required of all freshmen, and beginning with the fall 1966 term, Pratt will require 2 years of computer-oriented mathematics of all undergraduates.

Vanderbilt University is offering a **master's degree in astronomy**. The program is designed to help prepare students to continue toward the Ph.D., to train personnel for observatory work that does not require a doctorate but calls for familiarity with techniques, and to provide a background in astronomy for engineers interested in space science. Candidates for the program should have a strong undergraduate background in physics, engineering physics, or electrical engineering; training in astronomy is helpful but not required. Financial aid is available. (Director, A. J. Dyer Observatory, Vanderbilt University, Nashville, Tennessee 37203)

A **communication science** research center has been established at Battelle Memorial Institute's Columbus laboratories as part of the research program in communication, control, and information sciences. Julius T. Tou, director of the center, says that work will be expanded in mathematical linguistics, neurocybernetics, information storage and retrieval, and communication theory. Current communication science research at the Columbus laboratories covers artificial learning, pattern recognition, and learning control.

The **National Academy of Sciences** has established three parallel classes of membership, each composed of persons in closely related disciplines. Section affiliation will not be affected. The major purpose of the move is to increase the effectiveness of methods for considering for membership candidates whose fields are not primarily in a single Academy section. The classes will screen nominations within their professional spheres and prepare lists which will later become the basis for voting by the entire NAS membership. The classes are:

Physical and mathematical sciences: for persons in the sections on mathematics, astronomy, physics, chemistry, geology, and geophysics.

Biological and behavioral sciences: for members of the sections on botany, zoology and anatomy, physiology, pathology and microbiology, anthropology, psychology, and biochemistry.

Engineering and applied sciences: for those in the section on engineering.

The Carnegie Corporation of New York has created a national commission on **educational television** to conduct a broad study of noncommercial television. The study, to take 12 to 15 months, will focus on community-owned channels and their services to the public. The commission is expected to recommend ways for noncommercial television stations to develop in the future and possible ways for meeting their financial problems. James R. Killian, chairman of the corporation at MIT, is chairman or the commission; the headquarters is 26 New Street, Cambridge, Massachusetts.

Denver Research Institute has established a nonprofit, cooperative research center for **fundamental studies of oil shale** and its derivatives. The center is sponsored wholely by industry, and the initial sponsors are the Shell Development Company, the Oil Shale Corporation, and the Aquitaine Oil Corporation, a subsidiary of Société Nationale des Pétroles D'Aquitaine.

The research program will be directed by Josef Schmidt-Collerus, senior research scientist, and monitored by a technical advisory committee composed of sponsors' representatives. Three broad areas of research will be included: chemical constitution of organic matter and its relationship to the rock matrix; pyrolytic decomposition or organic matter, including kinetics and physical and chemical mechanisms; and physical properties of raw oil shale, particularly under overburden pressures encountered in *in situ* processing.

The institute is inviting petroleum and chemical companies to help sponsor the program through participation in the center. Research results will be restricted to participating companies, and the total number of participants will be limited. Additional information is available from Charles Prien, head of the Chemistry Division, DRI, University of Denver.

A division of **environmental sciences** has been created by the National Science Foundation. It will be responsible for NSF programs supporting research in atmospheric and earth sciences, physical oceanography, and the U.S. Antarctic Research Program; it will also oversee the scientific program of the National Center for Atmospheric Research at Boulder, Colorado. The director of the division is T. O. Jones, head of the Foundation's Office of Antarctic Programs since 1961; he will continue to head that office and will also serve as special assistant for Antarctic affairs, reporting to NSF director Leland Haworth. The division will be located in Washington.

Meeting Notes

Biomathematics and computer science in the life sciences will be the subject of a symposium to be held 24–26 March in Houston, Texas. It will be sponsored by the University of Texas graduate school of biomedical sciences. Areas to be covered include simulation and modeling of biological processes, training for bioengineering and biomathematics, analysis of biological processes with time-sharing computation, records and library information systems for a medical center, biostatistical techniques, and biologically oriented computer languages. (Dean, Division of Continuing Education, University of Texas Graduate School of Biomedical Sciences at Houston, Texas Medical Center, Houston 77025)

An international symposium on **animal toxins** will be held 8–11 April in Atlantic City, New Jersey, sponsored by the International Society on Toxinology and the division of comparative physiology of the American Society of Zoologists. Sessions are scheduled on the general biology of poisonous animals, structure of venom apparatus, chemistry, pharmacology, and toxicology of animal toxins, immunological problems in venomology, and clinical aspects of envenomation. (F. E. Russell, Box 323, Los Angeles County General Hospital, 1200 North State Street, Los Angeles, California 90033)

Analysis, significance, and production of **ceramic microstructures** will be the subject of the 3rd international materials symposium, scheduled 13–16 June at the University of California, Berkeley. The $45 fee will include all symposium costs, and the book of proceedings. (C. V. Peterson, University of California, Lawrence Radiation Labratory, Berkeley 94720)

A symposium on **organic scintillators** will be held at Argonne National Laboratory 20–22 June. Papers are invited on theory and mechanisms, applications, and recent advances; manuscripts primarily on medical and biological applications will not be accepted. Abstracts: 500 words; deadline: *15 April.* (Donald L. Horrocks, Chemistry Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Illinois 60440)

The University of Texas will present a conference on advances in **water quality improvement** in Austin 4–7 April. Topics are the effects of pollutants on streams, new concepts in treatment of biological waste, and changes in waste stabilization pond practices. A $25 registration fee is required. (Special Lecture Series, Engineering Laboratories Building 305, University of Texas, Austin 78712)

An international conference on **quantum electronics** will be held in Phoenix, Arizona, 12–15 April. The program areas will be basic theory and basic physics, quantum electronic devices and technology, and applications of quantum electron devices. (J. P. Gordon, Bell Telephone Laboratories, Murray Hill, New Jersey)

Grants, Fellowships, and Awards

The Menninger Foundation, Topeka, Kansas, offers a 2-year post-residency program of research training for **psychiatrists**. The program will include courses, independent research, and clinical work in the foundation's facilities, as well as the University of Kansas and Kansas State University. Applicants must have completed their military service, have a state license or certification by the Educational Council for Foreign Medical Graduates, and be U.S. citizens or have filed a declaration of intent to become citizens. Stipends are $11,000 the first year, and $12,000 the second. (P. S. Holzman, The Menninger Foundation, Box 829, Topeka, Kansas)

The California division of the American Cancer Society has established the Dernham junior postdoctoral fellowship in **oncology** for recent doctoral recipients interested in careers in any aspect of the biology of cancer. Grants are made directly to sponsoring institutions, which must be in California, although applicants may be from other areas. The fellowships provide stipends of $6000 to $8000 a year for 2 years; they may be renewed for another year. (California Division, American Cancer Society, 875 O'Farrell Street, San Francisco 94109)

The New York Botanical Garden is offering the G. S. Burlingham scholarship for advanced predoctoral study in **mycology** for next summer. The Garden's facilities will be available for the recipient's use. Work may begin at any time after 1 June and is expected to continue for about 3 months. The stipend is $800 to $1000. Deadline for receipt of nominations or applications: *15 April.* (Director, New York Botanical Garden, Bronx, New York 10458)

Applications are being accepted for two training programs in **steroid biochemistry** sponsored by the National Cancer Institute, one in Salt Lake City, Utah, the other in Worcester, Massachusetts. Both programs will include lectures, laboratory sessions, and research designed to train investigators in theoretical and methodological aspects. Stipends will vary according to the recipients' degrees. Application deadline: *1 April.*

The program established in Salt Lake City by the University of Utah is open only to persons with an M.D. or Ph.D. Appointments are for 2 years. (Kristen Eik-Nes, Department of Biochemistry, University of Utah, Salt Lake City). Predoctoral and postdoctoral candidates will be considered for 1-year, renewable appointments in Worcester. The program is organized by the Worcester Foundation for Experimental Biology and Clark University. (Donald S. Layne, Worcester Foundation for Experimental Biology, 222 Maple Avenue, Shrewsbury, Massachusetts)

Courses

A laboratory course on **histochemistry and cytochemistry** will be presented at the University of Pennsylvania 5 July to 12 August. Work will include methods of fixation; tests for RNA, DNA, proteins, enzymes, lipids, inorganic substances tagged with tracers; and demonstrations of possibilities for the use of electron microscopes in cytochemistry. Time will also be given to study of research problems of each student's choice. Participation is limited to 10. Deadline: *15 April.* (W. C. D. Hare, Laboratories of Anatomy, School of Veterinary Medicine, University of Pennsylvania, Philadelphia 19104)

A course for European scientists interested in **teratology** will be held 22–27 August in Copenhagen. Its aim is to familiarize scientists from universities and industry with concepts and methodology used in studying malformations. Breeding, dosage, evaluation of results, strain specificity in common laboratory animals, and examination for deformities will be covered. Participation will be limited to 40, but a limited number of observers will also be admitted. The course will be conducted in English by European and American instructors. Deadline: *1 April.* (Birthe Palludan, Department of Physiology and Endocrinology, Bülowsvej 13, Copenhagen 5, Denmark)

The University of California extension will hold an introductory course in the theory and techniques of **linear programming**, 14–25 March in San Francisco. The course will cover basic theory and will include special cases such as network flow and critical path problems, separable programming, linear programs with upper bounded variables, and decomposition methods. Emphasis will be on the use of readily available, general-purpose computer systems. Fee: $250; deadline: *7 March.* (Letters and Science Extension, University of California, 2223 Fulton Street, Berkeley 94720)

Ten Central American physics professors will enroll in a 2-year **physics course** to start in February at the University of Texas. The professors, still to be selected by the five participating universities, are specialists in other disciplines but are now teaching physics although they have had only minimum training in the subject. When they finish the course they are to resume their posts as physics professors at their home institutions. Costs of the program, including stipends equal to the professors' regular salaries, will be shared equally by the National Science Foundation and the five participating Central American schools. The schools are the universities of San Carlos de Guatemala, El Salvador, and Costa Rica, and the national universities of Nicaragua and Honduras.

R. N. Little, physics professor at the University of Texas, is in charge of the project.

Scientists in the News

Dean W. Stebbins, professor and head of the department of physics at Michigan Technological University, Houghton, has been appointed dean of the faculty.

George N. Austin, formerly associate professor and chairman of the section of orthopedic surgery at the University of Missouri, has been appointed professor of orthopedics and head of the division of orthopedic surgery at the University of Maryland medical school, Baltimore.

Sol Raboy, formerly a nuclear physicist at Argonne National Laboratory, has been appointed professor of physics at the State University of New York at Binghamton.

Alberta S. Gilinsky, formerly with the IBM Research Center, has been appointed associate professor of psychology at the University of Bridgeport.

Gerald L. Klerman, formerly principal research psychiatrist and assistant director of psychiatry at Massachusetts Mental Health Center, Boston, has been appointed director of clinical services for the new Connecticut Mental Health Center, New Haven, and associate professor of psychiatry at the Yale medical school.

Renato L. Baserga, formerly associate professor of pathology at Northwestern University, has been appointed research professor of pathology at Temple University.

Peter Abramoff, associate professor of zoology at Marquette University, has been appointed chairman of the department, succeeding **John W. Saunders, Jr.**

The Planned Parenthood–World Population organization recently presented its Albert Lasker award to **Estelle T. Griswold** and **C. Lee Buxton**, executive director and medical director of the Planned Parenthood League of Connecticut. They will share the $2500 honorarium for their defiance of a Connecticut law forbidding use of contraceptives. They were convicted in 1962 of violating that law by opening a birth control clinic; however, in 1965 the U.S. Supreme Court overturned the conviction and labeled the law unconstitutional.

Joseph Judis, professor of pharmacy and chairman of the biology department at the University of Toledo, will become dean of the college of pharmacy, beginning with the second semester. He will succeed **William S. Carlson**, who will be on leave during the second semester, after which he has announced plans to retire.

Robert G. Loewy, professor of mechanical and aerospace sciences at the University of Rochester, has taken a year's leave of absence from the school to serve as chief scientist of the U.S. Air Force. He will be responsible for technical and scientific advice to the Chief of Staff of the Air Force on plans, programs, and requirements.

Marshall J. Orloff, professor and chief of surgery at Harbor General Hospital, Los Angeles, has been named chairman of the department of surgery at the University of California, San Diego.

Oliver Schaeffer, formerly at Brookhaven National Laboratory, has become chairman of the recently established earth and space sciences department at the State University of New York, Stony Brook.

Anthony Gaudy, Jr., professor of civil engineering at Oklahoma State University, and director of the university's bioengineering and water resources program, has been named director of the school's recently established center for water research engineering.

Leo A. Kiley, commander of the Air Force Cambridge Research Laboratories, has been appointed commander of the Air Force Missile Development Center, Holloman Air Force Base, New Mexico. He will be succeeded at AFCRL by **Robert F. Long**, commander of the 4th Weather Group, Air Weather Service, at Andrews Air Force Base, Maryland.

Randall McVay Whaley, formerly vice president for graduate studies and research at Wayne State University, has become chancellor of the University of Missouri at Kansas City.

The Fiber Society has elected **B. Sheldon Sprague**, president. He is manager of the materials science research department at the Celanese Corporation of America research laboratories.

The National Bureau of Standards has appointed **Norman J. Ream** director of its recently established center for computer sciences and technology. He had been director for systems planning at Lockheed Aircraft Corporation.

Elliott L. Mancall, formerly at Jefferson Medical College, has been appointed professor of medicine (neurology) and head of the section of neurology at Hahnemann Medical College and Hospital, Philadelphia.

Harvard University has named **Alexander Hamilton Leighton** to head a new department, in the school of public health, for teaching and research in public health aspects of mental illness. He had been professor of social psychiatry at Cornell University medical college, New York.

Stacy B. Randle, state chemist and chairman of the department of agricultural chemistry at Rutgers, is the new president of the Association of Official Analytical Chemists. The group, formerly the Association of Official Agricultural Chemists, changed its name during the annual meeting.

Harald Bergstrom, of the Chalmers Institute of Technology in Sweden, is a visiting professor in the department of statistics at Florida State University for January to August 1966.

Sterling Wortman, formerly director of the Pineapple Research Institute of Hawaii, has been appointed director for agricultural sciences of the Rockefeller Foundation. He will supervise the foundation's programs for improving quantity and quality of food crops, training agricultural scientists in developing nations, and supporting national and international training and research institutes.

Annemarie Weber, formerly a lecturer in the department of zoology at Columbia University, has been appointed professor of biochemistry at the St. Louis University medical center.

Maynard M. Hufschmidt, director of research for the water program in Harvard University's graduate school of public administration, has been appointed professor in the department of environmental sciences and engineering and in the department of city and regional planning at the University of North Carolina.