vestigator directly to NIH and to de-emphasize his attachment to the administrative structure of his local institution. To overstate the matter, it appears that NIH, anxious to protect the investigator from any interference that might impair his freedom and thus his productivity has tended to treat the institution as a possible source of such frustration. Conversely, it appears that the investigator, a party to the traditional tensions between faculty and local administration, has rather comfortably accepted a role as a protege of NIH and of the national community of investigators in his technical field." The committee also offered the view that if the universities would take up the watchdog role which, in large part, has been thrust upon NIH by Congress, it would be politically and administratively easier for NIH to increase the amount of General Research Support Grants—that is, funds to be expended for research at the discretion of the university. NIH now limits these funds to 5 percent of the research grants at a given institution; the committee said that the amount might be raised to 15 percent, and added the suggestion that university science departments, outside of medical schools, be made eligible for such assistance.

The report strongly praised the operation of the Study Section system and endorsed its continuation as the best-known means for allocating research funds. It noted that the committee's panels had investigated 240 extramural grants, selected on a statistical basis from throughout the NIH program, and that it had "serious reservations" about only nine and had adjudged only seven to be "unworthy of support." It added, "In scientific research, such a ratio of ill-advised projects, when judged after the fact, is impressively low."

The most serious criticism was directed toward the NIH Collaborative Programs, especially the cancer chemotherapy program, which was established in 1956 following congressional pressure to explore even far-out possibilities for effective cancer drugs. The Wooldridge Committee said it "would not have advocated preventing the start of the program," but it noted that the chemotherapy program accounts for $30 million a year and is yet to produce any significant cancer drugs. Without intruding too far into the perilous territory of Congress and cancer, it observed that the program has lacked a strong scientific base, and it then gingerly stepped away with the suggestion that the program be reviewed by "an outside group of the broadest scientific character."

The committee also examined the question of the balance between NIH's intramural and extramural programs. The division at present is $160 million for all activities directly under NIH control, covering research, review, and administration, and $760 million for all outside activities, including research grants, fellowships, training, and state-control programs. The committee noted that it would defer to more thorough studies, but on the basis of what it had found, it concluded that the intramural research should be limited to work "uniquely suited to performance in federal facilities, rather than simply to the conduct of university-type reseach. . . . [We] are inclined to the opinion that optimization of the NIH program for the period that lies ahead will require some decrease in the present proportion of intra-mural research."

The report, which was delivered to President Johnson last week, has been forwarded to the Secretary of HEW for study. Considering the influential membership of the committee, and the fact that the White House Office of Science and Technology organized the study, the Wooldridge Report is likely to exert great influence on the future administration of medical research. If there are any contrary views, now is the time to make them known.

—D. S. GREENBERG

Boat with solar cell panels mounted on deck (left) negotiates light surf at Fort Story, Va. Solar boat developer John Hoke is aboard. With one panel mounted overhead (right), boat is tested on tidal river with one motor operating during Army tests.

Solar Boat: Army Evaluators Record a Plus for Novel Craft

A solar-powered boat, which became a minor *cause célèbre* in a congressional investigation of the research arm of the Agency for International Development (AID) in 1962, appears to be making some headway. The Army tested the boat and pronounced the use of solar cells for propulsion of lightweight craft feasible. And the rig last week was an item of interest at a Solar Energy Conference in Phoenix, Arizona.

The solar-powered-boat project figured in House foreign-operations subcommittee hearings on AID research contracting practices (*Science*, 17 May 1963). AID's solar boat was developed by John Hoke, who had conceived the project while serving in Surinam for AID. Hoke's idea was to construct a lightweight boat and give it an extended field test under tropical conditions to determine how well a solar-cell-powered battery recharging

center would perform as a source of power not only for propulsion but for low-wattage communications equipment and power tools.

Hoke left AID in June of 1963 to join a private research firm in Alexandria, Virginia, but the boat, based on a Haitian design, and its expensive custom-built solar panels, were completed under the original $28,000 contract. The solar boat, however, was not tested in the tropics.

Last January AID suggested that the Army Materiel Command consider military applications of the boat, and the Army took up the idea. Tests to evaluate the military potential of the borrowed solar boat were conducted between the end of July and the end of October, and a final report was submitted in December.

The Army concluded that "the use of solar cells for propulsion of lightweight watercraft is feasible; the Solar Boat may have potential military application where it is necessary to operate quietly and without using conventional fuel. . . ."

Because the Army was interested in the performance of the collapsible, canvas-covered boat, the test centered on the boat and its limitations and did not emphasize the performance of the solar cells. The report, for example, does not indicate detailed testing of the solar cells, connected, as they may be, either directly with a motor or indirectly through batteries to one or two motors.

Apparently the cells are capable of an output of 150 watts in good weather, which means that they could supply a total 1000 to 1500 watts of power a day in the tropics. According to Hoke, the AID boat should be able to operate on both motors at a speed of about 5 miles an hour if wind and current are not taken into account.

The main obstacle to the use of solar energy for lower-power applications remains the high cost of solar cells. AID lent the boat for the Phoenix meeting, and is currently considering ways to make the prototype propulsion system available to researchers in order to encourage work that will result in the reduction of costs.

Hoke still thinks that solar energy is particularly adaptable to use in underdeveloped areas where power is a problem, and he would probably like nothing better than to see his original solar-boat idea tried out in some place with sluggish rivers and lots of sunshine—like Surinam.—JOHN WALSH

Announcements

Illinois Institute of Technology Research Institute has announced a **medical engineering** center. Its major purpose will be to coordinate IITRI's skills in the physical sciences and engineering to help medical researchers devise needed instrumentation. The new facility is headed by William E. Reynolds, assistant director of mechanical engineering, and will include representatives of all the school's research divisions.

Courses

The University of Texas and Varian Associates will sponsor a course on **nuclear magnetic resonance and electron spin resonance spectroscopy** 31 May to 4 June. It is designed for beginners in the field and will include lectures, demonstrations, and laboratory work. The course fee is $35 for teachers, $75 for others. (NMR–ESR Course, Department of Chemistry, University of Texas, Austin 78712)

The U.S. Public Health Service and the U.S. Bureau of Mines will sponsor a symposium on **photochemical aspects of air pollution**, 20–22 April in Cincinnati, Ohio. Discussion will be centered on the following: ultraviolet solar radiation measurements in the lower atmosphere, photochemical primary processes and secondary reactions in the photolysis and photooxidation of various simple and complex systems of interest in lower atmosphere reactions, aerosol formation, plant damage and eye irritation as indicators of photochemical air pollution, and reactivity concepts and the relation of laboratory measurements to aerometric data. (A. P. Altshuller, Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati, Ohio 45226)

The Marine Biological Laboratory at Woods Hole, Mass., will conduct a training program in **comparative physiology** 15 June to 30 August. It will consist of informal lectures and discussions, along with research work on the physiology of marine animals, with emphasis on osmotic and ionic regulation, endocrinology, circulation, and muscle physiology. Traineeships for postdoctoral and advanced predoctoral students are available. Deadline for receipt of applications: *20 April*. (Marine Biological Laboratory, Woods Hole, Mass. 02543)

Two courses on **epidemiology** will be presented at the University of Wisconsin, 21 June to 30 July, for medical school teachers, public health officials, graduate students, and residents. The introductory session, 21 June to 9 July, will consist of fundamentals of epidemiology and of biostatistics, and teaching methods. The second session, 12–30 July, will include the epidemiology of infectious diseases and of chronic diseases, and human heredity. Applicants may register for either or both courses; for the second, basic courses in basic epidemiology and statistics or equivalent experience are prerequisites. Travel and subsistence grants are available for U.S. citizens. Deadline for receipt of applications: *30 April*. (A. S. Evans, Department of Preventive Medicine, 437 Henry Mall, Madison, Wis. 53706)

Meetings

General Atomic division of General Dynamics Corporation, San Diego, will present a seminar on **activation analysis** 26–28 April. Papers will be presented on techniques and applications. A tour of the General Atomic activation analysis facilities will include the TRIGA reactors, 45 Mev Linac, 14 Mev neutron generators, gamma-ray spectrometry laboratories, and the new activation analysis building. Demonstrations will include a 1000-megawatt reactor pulse (giving a peak neutron flux in the range of 10^{16} to 10^{17} neutron/cm^2 sec), and an automatic oxygen determination. (V. P. Guinn, General Atomic, Box 608, San Diego, Calif.)

Scientists in the News

William L. Ford, chief of personnel at Canada's Defence Research Board, has been appointed director of the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, effective about 1 April.

Robert S. Gordon is the new clinical director of the National Institute of Arthritis and metabolic diseases at NIH. Formerly a senior investigator in the National Heart Institute's metabolism laboratory, he succeeds **Joseph J. Bunim**, who died in July.

Francois Mergen, professor of forest genetics at Yale, has been named dean of the forestry school as of 1 July.