

Success at the Trieste Centre—an Interview with Abdus Salam

When we talked with him in Trieste during the summer, Abdus Salam was a man considerably fulfilled. The International Centre for Theoretical Physics, which he first suggested in 1960, had just moved into splendid new headquarters. A four-week International Symposium on Contemporary Physics had assembled a unique concentration of great physicists from all parts of the world. Despite what is to Salam a "miserable" budget and frightening uncertainty about meeting it, his center is entering its second lease on life (the first, 1964-68; the second, 1968-74) with considerable vigor. And the formula Salam has devised for developing countries, unlike most efforts, appears to help them without making any contribution to the brain drain.

Establishing the center. Salam was the Pakistan delegate to the International Atomic Energy Agency when he first suggested the center to the IAEA General Conference. The suggestion was generally opposed as unrealistic. In 1961 the Italian Government became interested. In 1962 influential forces like the US and USSR were still lukewarm, says Salam, until the persistent demand from the small countries overwhelmed them with their votes and changed their thinking. Then the center was voted into existence and established in 1964.

The new building, providing 4500 square meters of floor space, overlooks the Adriatic in Miramare about 6 km north of the center of Trieste. It is a conservative modern four-story air-conditioned building supplied by the City of Trieste at \$1 per year. Most of the second "story" is open space through which run central columns that support stories 3 and 4 with their offices and large library. The ground floor has a large central lobby, a 300-seat and an 84-seat lecture hall—the large one fully equipped with such luxuries as button-controlled microphones at all seats.

Funding. "Our main problem is money," says Salam, explaining that the center, with an average population of about 80, exists on only about \$500 000 a year (for all administrative

and scientific costs)—\$150 000 from IAEA, \$250 000 from the Italian Government, \$27 000 from UNESCO (the United Nations Educational, Scientific and Cultural Organization) and \$70 000 from the Ford Foundation. In 1970 UNESCO becomes a full partner with IAEA and increases its allotment to \$150 000 per year, but plainly Salam would like to see more.

Developing countries. The problem of developing countries in science, says Salam, is not lack of funds in these countries, and it is not lack of opportunity. The theorist, in particular, has few needs, and he can spend long periods working out ideas. The problem is isolation. The scientist needs frequent contact with colleagues, and this need (unrecognized and unmet in his own country, he says) stimulates the brain drain.

Salam's solution is associateships. The physicist of a developing country is guaranteed a stay of about three months each year at the center on condition that for the rest of his year he carries on his work at home. According to Salam at least four particular examples in his experience show how the system works in general; in each of these situations a scientist was about to leave a developing country for an opportunity elsewhere; when offered an associateship at the center, he decided to stay at home.

At present \$30 000 per year of the Ford money is supporting the associateship scheme and 27 associates have been appointed. The idea has caught on elsewhere, and institutions in the US and UK are planning to put similar mechanisms in motion.

Another program accepts institutions as affiliates of the center. Such an affiliate receives a quantity of time or money (which one depends on location) that it can use to send its physicists to the center. For example, two institutions in Poland have 45 days per year so that one of their staff can come for 45 days or two or more can come for a total of 45 days. The home organization pays travel; the center pays a per diem. So far the effort is small; \$20 000 per year is spent.

Population of the International



SALAM WITH FRIENDS. Paolo Budini (left) is deputy director at Trieste. Sigvard Eklund (center) is director general of the parent organization, IAEA.

Centre for Theoretical Physics averages about 80: four permanent professionals, about 12 secretaries, typists and clerks, and the remainder visitors. In addition to Salam who spends about two thirds of his time in Trieste and the remainder at Imperial College, London, the professionals are Deputy Director Paolo Budini, University of Trieste, André Hamende, a PhD physicist serving as scientific information officer, and Peter Rendi, a Viennese who transferred with Hamende from IAEA to serve as administrator.

Visitors fall into several categories: on the average 15 are IAEA and UNESCO fellows, 25 are visiting scientists with periods of stay ranging from a few months to over a year, 10 are free-cost scientists (receiving hospitality but no stipends) and eight are associates in residence. Salam says that 60% of the visiting man-months go to developing countries.

Program. "I don't believe in a diffuse type of activity," said Salam when

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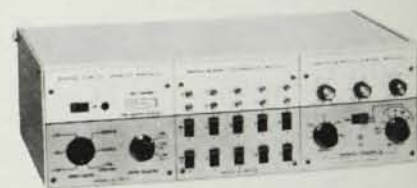
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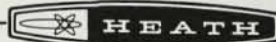
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we talked with him. He went on to say that the center must be, first of all, a good center for physics. The program with which he is convinced he is achieving the goal has several parts. An academic year is divided into two main sessions, one for research and one for an "extended" course. Shorter courses on different branches of physics last three to twelve weeks. So far the subjects of extended courses have been high energy, plasmas, nuclei, particles and condensed matter (solids and liquids). This summer's symposium, covering the whole spectrum of physics, which drew a population of 320 from 43 countries, including eight Nobel-prize winners, was an advanced review of the contemporary scene with all the specialists hearing about fields different from their own.

—RHE



NEW HEADQUARTERS, provided by city of Trieste at \$1 per year, looks down on Adriatic from a hillside in Miramare, about 6 km north of the middle of Trieste.

Institutional-Grant Bill Supported in House Hearings

An alternative to the project-grant approach to federal support of scientific research is gaining ground in Congress. The House Subcommittee on Science, Research and Development held hearings in July on a bill that would grant \$150 million a year to colleges and universities by formula rather than by project.

The purpose of the bill, HR 875, is to distribute government research money more widely and to ensure that smaller, less endowed schools benefit from federal research programs. Basically the bill would establish a formula that applies geographic, population and academic-incentive criteria to the task of allocating funds.

One third of the money would be given to schools on the basis of advanced degrees. The schools would split up this \$50 million in proportion to the fraction of the total master's and doctor's degrees each school produced in the preceding three years. Degrees in physical, social and biological science, mathematics and engineering would be counted.

One third of the funds would be given to the states in proportion to their share of the total high-school graduates in the country. The states in turn would distribute their share to their colleges and universities on the basis of credit hours offered in the fields mentioned.

The remaining one third would go

directly to schools on the basis of project awards in the previous year from the National Science Foundation, the National Institutes of Health and the Office of Education, with a maximum of \$300 000.

Rep. Emilio Q. Daddario (D-Conn.), chairman of the subcommittee, said, "The momentum we built up in scientific and technological education must not be lost for lack of adequate support." He told the hearings that "we must maintain our high plateaus and elevate our lower ones."

In testimony before the committee, Donald F. Hornig, head of the Office of Science and Technology, pointed out some of the disadvantages of the project grants. They are highly specific and benefit the individual researcher. So while his school benefits indirectly, it can not shift the grant to fields in which it is trying to establish competence. Then, too, project grants can be discontinued with no regard for the welfare of an individual university.

Although he feels that project grants must be the basic mechanism of federal scientific-research support, Hornig sees institutional grants as a necessary supplement to give schools the ability to set and achieve their own goals and insure an equitable distribution of funds to developing schools.

Other leading science and education figures, including Leland Ha-

worth, head of the National Science Foundation, also testified in support of some form of institutional-grant system. The big question appears to be the actual provisions of the formula. Haworth questioned whether the proposed formula, because of its provisions whereby funding depends on advanced degrees and previous projects, might not benefit the larger graduate schools anyway. Citing the NSF grant program aimed at establishing centers of excellence, Haworth gave his backing to the concept, if not the method, of HR 875. The bill is not expected to be sent to the full House this late in the year, but a new version will be introduced when Congress convenes next year.

—JJ

AIP Corporate Associates Meet This Month in New York

Corporate Associates of the American Institute of Physics and officers of AIP member societies will gather in New York this month for a two-day annual meeting. An evening session is scheduled for 25 Sept. at the Hotel Roosevelt; the meeting moves to Rockefeller University the next day for a morning session on the frontiers of physics and an afternoon devoted to applications.

On Wednesday evening Frederick A. Seitz will moderate a panel discussion on "Policy Trends and Projections in Science." Weston E. Vivian, for-