

Visit

KANPUR INDO-AMERICAN PROGRAM
Indian Institute of Technology
KANPUR

Monthly Report to USAID
October 1965

Arrivals and Departures of Staff:-

Gio Wiederhold left Kanpur early in October to return to California after a tour of one year with the Program. He is replaced by Gerald D. Johnson, Chief Programmer for the Cancer Research Medical Center (San Francisco) at the University of California's Computer Center, who arrived with his wife later in October for a tour of two years. See below for some information on the state and prospects of IIT/Kanpur's computer facilities at this juncture.

George N. Petievich arrived October 20 with his wife and children for a stay of two years. Mr. Petievich has recently served as administrator in the office of the Director of the University of California's Livermore Radiation Laboratory. He will eventually replace Glenn J. Battaglia as KIAP Administrative Officer.

Frederick Suppe, Instructor in Philosophy at the University of Michigan, arrived in Kanpur October 9 for a two-year stint as a Research Assistant at this Institute. Mr. Suppe is a mathematical logician specializing in metamathematics, automata theory, and axiomatic methods in the exact sciences. While with the Program, he will work on his PhD. dissertation, which deals with structural interrelations between exact scientific theories and metamathematical models. He will aid Professor Burks in the preparation of two books for publication. And he hopes to help develop at this Institute, in concert with Burks and others, an inter-disciplinary program in that area where logic, philosophy, mathematics, cybernetics, and computer theory impinge upon each other.

Leonard Z. Breen left Kanpur with his family on the last day of October to return to the Sociology Department of Purdue University. For some information on what he did while he was here, see the September monthly report. During their fifteen months with the Program, his wife Millie contributed very considerably to the cultural life of the Institute community by continuing her painting (she is a professional artist and art teacher), by holding one show, and by conducting art classes for interested undergraduates. She was enthusiastically assisted in this last by the student Gymkhana and Mr. E.K. Das.

I.I.T./Kanpur's First Convocation:-

On the afternoon of Sunday, October 31, in a large many-colored tent erected just west of the Science Block, the Institute held its first Convocation. Bachelor of Technology degrees were conferred upon sixty-six members of the Institute's first graduating class: eight in Chemical engineering, six in civil, fifteen in electrical, twenty-three in mechanical, and fourteen in metallurgical. The Doctor of Philosophy degree was conferred upon five post-graduate students: three in math, one each in mechanical engineering and physics.

President Radhakrishnan came down from Delhi to deliver the Convocation Address. The Director, P.K. Kelkar, gave a report on the growth and prospects of the Institute. H. Guyford Stever, President of Carnegie Tech, presented a scroll on behalf of the nine Consortium universities. Among other special guests were Norman Dahl, first Program Leader, Joseph N. Greene, Deputy Chief of the U.S. Mission in India, and a number of distinguished Indian political figures.

Next morning, as the tent came down, the library began moving into the new Library Building.

Computer Center:-

When a year ago Gio Wiederhold (Berkeley) took the place of Irv Rabinowitz (Princeton) as the Program's contribution in personnel to the development of the Computer Center, the Center was already a flourishing concern. Headed by Professor H.K. Kesavan of Electrical Engineering, and using the IBM 1620 installed during the summer of 1963 in an airconditioned wing of the Western Laboratory, the Center made its digital computation facilities (central processor with 40,000 digit core storage, three 7330 magnetic tape units, and a 1622 card input-output unit) available to students, faculty, and (to an extent not matched by any other part of the Institute) to research and industrial people from outside.

During Mr. Wiederhold's year the Center cooperated in offering a Technical Arts course in computational techniques required of all undergraduates in their third year. It gave a number of intensive courses in computer programming (to date seven have been offered, to nearly five hundred persons from all over India), each of ten days' duration, with three hours a day of lectures in Fortran programming, numerical analysis, and computer logic, and three hours a day of actual use of the 1620. It organized two six-week courses in SPS programming, and a three-week course on systems programming - attended by about twenty-five persons from a dozen different institutions both academic and

business. And with what computer time it had left it made itself available for the research requirements of Institute faculty and post-graduate students.

But the 1620, though useful (there are perhaps a dozen in operation in India today; perhaps ten 1401's, the slightly bigger version intended for commercial use, should also be in use by the end of this year), was never supposed to be the Center's only hardware and for some time now has been clearly unable to do all the things the Institute would like it to do. It is a good machine for educational purposes, for some research (particularly in Physics), and for such incidental jobs-as grade computation. But it is already being used up to the hilt, twenty-four hours a day, for these things; and it is not adequate for most kinds of research problems. It was long ago decided, therefore, to follow the 1620 with an IBM 7044. And after a good deal of trouble over cost (the 1620 costs \$200,000 commercially, the 7044 about \$3,000,000 - but a 60% educational discount brings the latter figure much lower), rate of dollar repatriation to be allowed IBM by the Government of India, and certain other things, a contract for the delivery of the bigger machine was finally signed by the Director in October.

Phase 1 of this machine consists of a "stand-alone" 7044 with its own input/output devices and some additional tabulating equipment. It is scheduled to be shipped from New York within a few months, to arrive at Kanpur in April of 1966, and to be installed in the airconditioned space in the Western Laboratory already occupied by the 1620 - an arrangement possible if the key punch equipment is put somewhere else. Meanwhile the new Computer Center Building, for which the foundation stone was laid September 25, will be going up north of the new Library Building. When it is completed (perhaps in August, 1966), Phase 1 will move to it.

But a "stand-alone" 7044, though more than five hundred times faster than a 1620, is somewhat inefficient by itself because it spends most of its time waiting for input/output. Phase 1 will therefore be followed by Phase 2: an IBM 1410 to be coupled to the 7044 solely to handle input/output for the larger machine, thereby allowing the latter to compute almost full time.

This system of having computers working together allows optimum data processing for many computer users (it is known as "batch" processing). But it is obviously limited as a student training aid. Phase 3, therefore, will involve the adding of six 1014 typewriter consoles attached to the 7044 for direct student communication with the 7044. The speed of the 7044 is such that it can process input/output

from the 1410 computer while simultaneously interpreting all six typewriter consoles, with no significant decrease in its "batch" processing time.

The 1620 will be kept, but used solely for educational purposes.

The arrival and setting up of these three phases of the 7044, in the direction of which Gerald Johnson expects to have the pleasure of participating, will greatly increase the capacity of the Computer Center. It will not of itself, however, entirely solve the Center's problems. Maintenance will be taken care of by two IBM technicians (for the 1620 there is at present one) in residence. But there is still the question of staff. Half the cost of a computer, it is estimated, lies in systems programming, materials, maintaining a computer library. To handle these, technical assistants are needed - and as elsewhere at this Institute, they are hard to find. At the moment there are only four such assistants in the Center; and since the Center operates twenty-four hours a day, it often happens that only one is present - not nearly enough. Turnover is high, moreover. With great difficulty the Center selected and hired three additional technical assistants during the past year, only to have two leave soon after they had joined for better jobs. And if hiring procedures are cumbersome, firing procedures are almost nonexistent. Finally, there is some question in Mr. Wiederhold's mind at least whether the Center ought to remain as closely wedded to the Department of Electrical Engineering as circumstances and the undisputed enthusiasm and competence of members of that department have arranged. A more natural union, he thinks, would be with a department of Applied Mathematics - not the present I.I.T./Kanpur variety, but the proper sort, what might be called "engineering mathematics."

Miscellaneous:-

Details of the requisitions processed in the month of October, 1965.

GOI Title Equipment	\$13,888.00
GOI Title Books	\$ -
Sub-total 1	\$13,888.00
U.S. Title Equipment	\$21,060.70
U.S. Title Books	\$ -
Sub-total 2	\$21,060.70
GRAND TOTAL (1 + 2)	\$34,948.70

...5

Professor Kelley delivered lectures at universities in Madras and several other places in south India. Professor Seckel spent some time in New Delhi advising the I.I.T. there on its aeronautical engineering curriculum. Professors Brown, Welch, and Smullin attended a seminar on technical education at the same I.I.T. Professor Mason gave a talk to the Delhi section of the Institute of Electrical Engineers. Professor Breen lectured before the Gandhian Institute of Studies at Varanasi.

These were among the activities during October of Program members.
