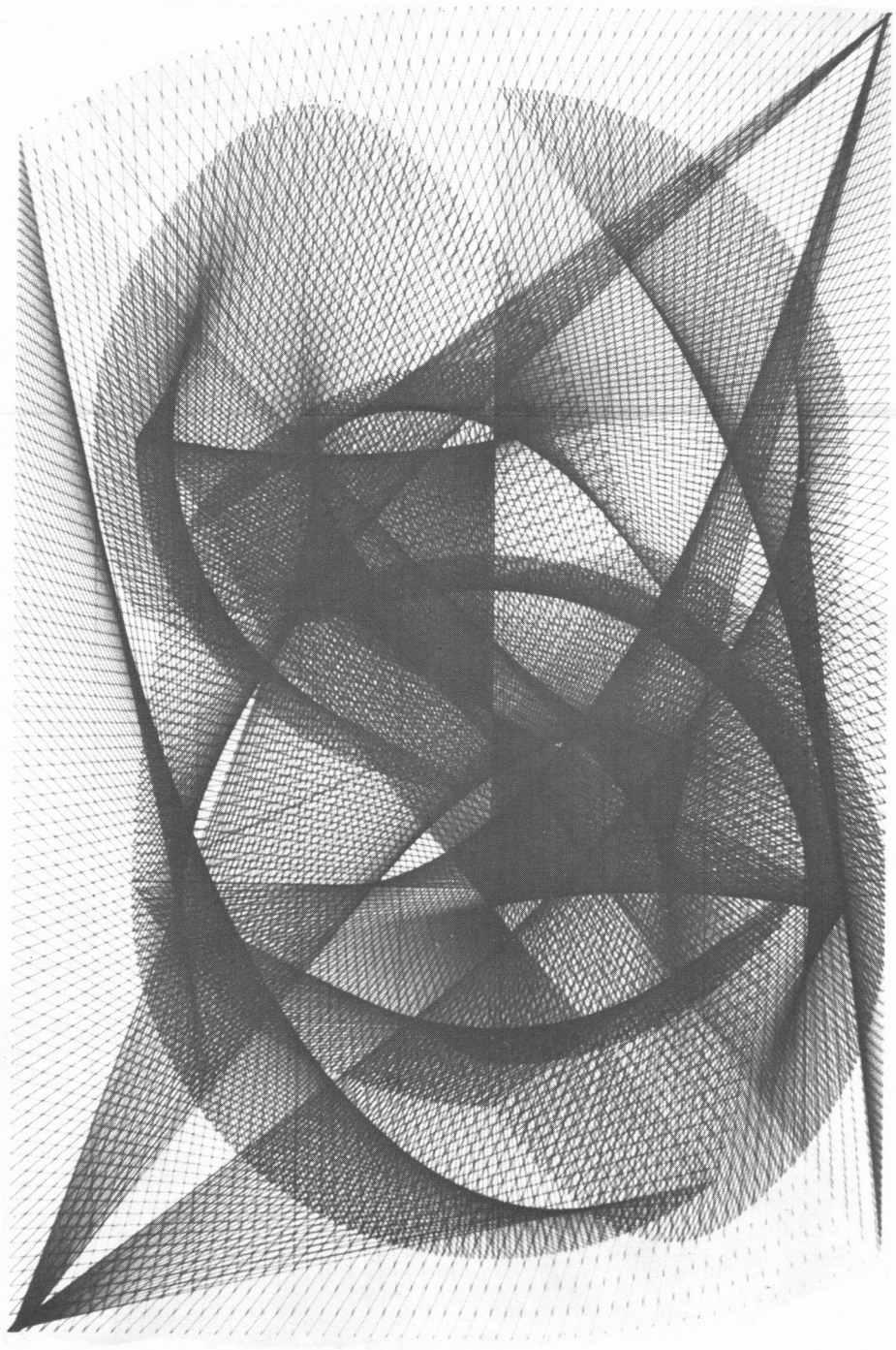
Stony Brook Review

Let's Look Ahead to... 2001

Life in 2001 A.D., only 30 years away, is discussed here in the second article in a future-oriented series written by distinguished members of the Stony Brook faculty.

Computer graphics by Sharon Spark, Brookhaven National Laboratory

A MONTHLY PUBLICATION OF THE STATE UNIVERSITY OF NEW YORK AT STONY BROOK



MEDICINE IN 2001

by Dr. Edmund D. Pellegrino
Vice President for the Health Sciences

Dr. Pellegrino has, since 1966, been planning and preparing for the multi-million dollar Health Sciences Center to be built at Stony Brook. Permanent facilities are now under construction and courses are already in progress in the fields of nursing, social welfare, allied health professions, and basic health sciences. The School of Medicine will open in September 1971, and the School of Dentistry in 1972. A University Hospital and Veterans Administration Hospital are planned. Many of the thoughts expressed in this article have been carefully considered in the design and organization of the new Center.

Despite its inherent dangers, prophecy is an unavoidable and even a necessary ingredient of planning for the future. Its necessity is immediately apparent if we appreciate that the first graduates in the health sciences at Stony Brook will reach the apex of their careers as the 21st century begins. Some assessment of the future, then, is essential if the education we provide is to have utility for the world in which our students will live and practice.

The health professions are phenomena of society and instruments of social purpose. The transformations they undergo are inextricably bound in the matrix of technologic, scientific, political and economic forces now changing the configuration of contemporary society. A brief view of the physiognomy of the society emerging in the next quarter century should reveal some of the newer health needs that will demand the attention of the health professions.

We can anticipate a densely populated world in which humans are concentrated into complex, highly organized social organisms. Agglomerations of humans will coalesce into super-cities like bacterial colonies on an aging agar plate. New problems of health and survival are already being created by affluence, technology, and the proximity of human to human and culture to culture. Our megalopolitan cities extrude vast quantities of toxic effluvia despoiling land, sea and air. Our needs for food, water and power seem to be insatiable. A shortened work week, the extended life of individuals, and more time for leisure will produce a more educated populace, increasing the demands for lifelong education and better health for all. Each individual on the earth will be united to the other in a nexus of information, transmission and communication devices.

What will medicine be like in a densely populated world with humans concentrated in supercities, living in a tightly organized and highly dependent world society, in which basic needs are supplied by automated processes, and in which leisure and group living may be the major adjustment problems?

Medicine itself will, perforce, follow the societal trend toward complex organization and institutionalization. A system of medical care will emerge which reaches into every community to make the full spectrum of technical knowledge available and accessible to every citizen. We can anticipate a fully developed regionalized system of medical institutions of three kinds.

First, neighborhood or district centers will be the points of immediate contact for the majority of people who have a health problem. These centers will provide emergency and primary care, as well as preventive medicine. They will supply immediate and efficient

> "Agglomerations of humans will coalesce into super-cities."

care for the majority of the simple ills of mankind. By means of computers, television and microwave hookups, these primary centers will be in instantaneous contact with more complex and more sophisticated regional institutions, so that consultation and referral are immediately available for the difficult problems requiring specialized techniques or equipment. These first-contact centers will very likely be manned largely by physicians' assistants, trained to ad-

minister the simpler aspects of surgical, medical, obstetrical and pediatric care. These assistants will be "programmed" to make prudent decisions under direct or indirect supervision of a new type of generalist physician specifically educated for coordination of the process of care in a highly articulated system.

Second, regional community health centers will treat patients with the more difficult but common disorders requiring specialist care or specialized equipment such as X-ray treatments, chemotherapy for malignancies, operative care, etc. These community hospital centers will provide a full range of specialist services and be staffed by a core of full-time physicians, largely specialists. Associated with them in health care teams will be a large number of other health professionals: social workers, pharmacists, physical therapists, nurse clinicians and technicians of all sorts. The community hospital will function as an essential back-up element for the primary centers.

Third, these expanded community hospitals will, in turn, be associated with university centers to which they can refer the extraordinary case, the new clinical entity, and the patients requiring the most expensive and complicated equipment and technical specialists. The university centers will be teaching and research centers, emphasizing clinical investigation and experimental procedures. By means of radio, television and computer networks, the university centers and their faculties will be available to the secondary community and primary neighborhood health centers for consultation and teaching.

Progress in scientific medicine, technology and social organization are now interacting to induce profound transformations in the nature and ecology of human illness. The conquest of infectious disorders will continue and will extend to the viruses and fungi. New problems will result from the disturbances of bacterial or viral ecology induced by mass immunizations and antibiotics usage.

The bulk of acute medical disorders will arise from trauma, burns, and exposure to man-made environmental hazards like radiation and ingestion of toxic chemicals, as well as air and water pollution. Acute exacerbations of chronic illnesses will remain, but they will be anticipated more readily.

The major effort in medical care will thus be directed to the chronic degenerative diseases and aging. Chronic disease will not be eliminated for a long time, if ever. Better understanding of its pathophysiology and social and emotional consequences should lead to more effective preventive and ameliorative measures.

A deeper knowledge and a concern for chronic care, rehabilitation, and the process of personal-social adjustment will be required if physicians and their associates are to help the bulk of people with chronic illnesses and disabilities to live longer and more satisfying lives.

Emotional problems will continue to be major contributors to disability and loss of effective living. However, they will assume a new character, as a consequence of social changes already in progress. Alienation from, or rejection by, the group may be the major problem in human adjustment. Prominent sources of stress will be found in overcrowding, the unrelieved proximity to others, and the crisis of identification as a person endemic to a group-oriented society. The family as a source of stability and moral values seems certain to continue to lose status. Ontological and existential anxiety will mar the normal emotional and psychological development of large numbers of children and adults.

Medicine must face responsibly the new philosophical and ethical issues raised by medical progress.[1] We are already deeply immersed in ethical questions raised by organ transplants and human experimentation. Even more significant issues lie ahead in such matters as control of the genetic constitution of future generations, modification of the behavior of human beings, and the selection of socially useful (versus individually beneficial) goals. The traditional religious and philosophical systems do not deal specifically with such new issues, nor do the traditional codes of medical ethics. New definitions of the individual and of the social responsibilities of the physician are needed even now. But, increasingly, medicine will need to enter into a fruitful dialogue with all responsible members of our society on the selection of goals, the definition of values, and the determination of the ends to which its greatly increased powers can and should be directed.

Within this altered social, technical and intellectual matrix of the last years of the 20th century, the role of the physician will necessarily be transformed. If we could tell precisely what the transformation would look like, our educational efforts in the next decade would be far more rational than actually will be the case. Only a semi-intuitive guess can be made, however.

To function effectively in the new scientific and social milieu of the 21st century, a new spectrum of demands will be imposed on the physician. These demands derive from an expanded definition of professional competence, from the new technologies the doctor must master to deal with the efflorescence of new knowledge and the emergent patterns of medical care. To extend the individual physician's capabilities and competence, four mechanisms are already developing rapidly: specialization, computerization, regionalization of facilities, and the team approach.

It is apparent that humans living in the highly organized social order of the future will find it natural to turn to institutions, as much as to individual physicians, for medical care. Many more physicians will be working in some type of institution or group under private or governmental sponsorship.

It is clear that many, if not all, of the physician's present manipulative tasks will be assumed by nonphysician technical helpers or machines. Already, the history and various parts of the physical examination, as well as the laboratory investigation, of the patient can be effectively automated. Diagnostic probabilities and even value judgments on the selection of the most prudent action in a given case will be handled by computer for such things as routine examinations and the more common ills. The developing systems of information storage, retrieval and delivery will place on instant call the detailed observations of past and contemporary clinicians. Instead of amassing facts in his own brain, the physician will use electronic instruments to find information and put it in order. Minor surgery, normal deliveries, well-baby care are all within the capabilities of well trained clinical nonphysicians.

Physicians will be of two types, the technical-oriented specialists and the general physician. The first will have a very deep knowledge of very limited fields and will function largely in the community hospital health centers and the university centers. Here, too, there will be an increasing tendency to involve nonphysician technical helpers of various types.

The generalist group of physicians is most difficult to define, but also most sorely needed. This physician will evolve from today's family and general practitioner. He will be responsible for supervision of the complicated process of medical care, coordinating personnel, facilities and equipment for the benefit of the patient. He must know what the technical experts can contribute and be aware of how to evaluate the data produced by the computer. It will be his task to prepare new programs and pose the condtions of a solution.

Even if the changes we have forecast come to only partial realization, it is clear they will drastically affect the nature of medical education. For example, technical specialists, general physicians and physicians' assistants will each require very different preparation.

Continuing education will be mandatory in all the health professions to forestall the invariable obsolescence of knowledge, which medical progress so rapidly induces.

To deal with the philosophical and moral problems created by medical progress, physicians must be prepared better in the formal knowledge of the fields of sociology, ethics, philosophy, religion. In short, a better general education, but one built on specific medical problems, is essential.

The development of computer-assisted education in the next decade will materially alter such things as faculty-student ratios, the design of medical schools and of medical libraries, hospitals and clinics. Technologic aids — the computer, television, film-automated carrels — will supplant many of the usual lectures and laboratory sessions. Constant examination and refurbishment of the curriculum are essential. It may well prove possible to eliminate up to three of the usual 12 years of training after high school usually required to prepare a physician for practice today.

A conspicuous change that may ultimately affect practice is the apparent social awareness of part of the medical student body. More students are consciously interested in political causes and the uses of medicine to ameliorate social ills. They expect to have a direct role in the design of curricula toward these ends. Many are interested in medicine as much as a means of personal fulfillment and social service as of livelihood. Many are also genuinely desirous of sharing the experiences of the sick and the poor, the better to understand and serve them.

The future is an exciting one for the health sciences. To speculate would be to extrapolate too far beyond the limits of present probabilities. The challenges posed by an exponentially changing world can be met only by flexibility, readiness for change, and perceptiveness to the currents of evolution of the social and scientific forces that shape medicine as forcefully as it, in turn, affects them.

> "The bulk of acute medical disorders will arise from trauma, burns and exposure to man-made hazards."

At Stony Brook, the responsibilities and possibilities inherent in the Health Sciences Center concept will be realized if the right balance between flexibility and structured planning and between enthusiasm and prudence can be struck. If it is, the University will make a significant contribution to health in its broadest sense and to the students it educates for significant roles in the world of the 21st century. □

[1]Edmund D. Pellegrino, "Physician, Patients, and Society: Some New Tensions in Medical Ethics." Everett I. Mendelsohn, Judith P. Swazey and Irene Taviss, editors, *Human Aspects of Biomedical Innovation.* Cambridge: Harvard University Press (in press).

AFRICAN STUDENT INTERVIEW

More Than Miles Separate Stony Brook From Addis Ababa

At home, in the Nigerian capital of Lagos, if Jide Lawal strolls over to a neighbor's at evening time, his family assumes he will stay there for dinner. Invitations are never necessary.

And in the Ethiopian capital of Addis Ababa, where Tseggai Kidane lives in a large stone house behind an imposing wall, gates and doors are never locked. There, too, neighbors are friends, by definition.

It is more than 2000 miles from the highland capital of Addis Ababa to Lagos on the Atlantic coast. The histories of Ethiopia and Nigeria differ greatly. Yet both countries have clearly preserved the communal traditions that still flourish in rural and urban areas all over Africa.

For Mr. Lawal and Mr. Kidane, both Stony Brook sophomores majoring in engineering, the change in cultural focus from the community to the individual constitutes the main difficulty of being a foreign student in the United States. It is not that the American way is inferior — just lonelier.

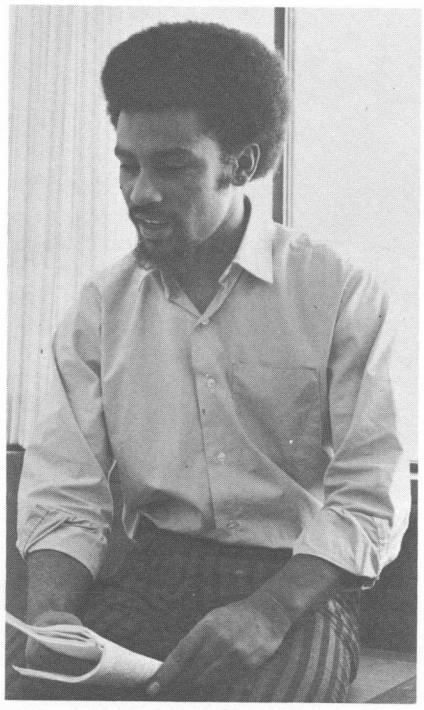
"At home people are friendlier not only in their neighborhoods but in the schools, too," recalls Mr. Kidane. "At my boarding school, there were young people from all over; strangers. But immediately everybody talks and laughs; by the first night, you are really friends."

Mr. Lawal, pointing to the closed door of his room in the International Residential College, agreed: "When I came here last year, I had to look out into the hall at least. I could not close myself up. But everyone told me I had to; so now it's closed and locked."

He says that in Africa, despite tribal conflicts where politics and money are involved, young people of all backgrounds are mutually trusting. Here, he added, "American students seem to live in suspicion of one another and of foreign students too. So the foreign students' friends are usually other foreign students. If there was not something like the International College, there would be a very large gap between foreign and American students."

Mr. Kidane thinks the fledgling International College may temporarily have worsened the problem. When he lived in an ordinary dormitory, without such easy access to people with similar adjustment problems, he was forced to mingle more with Americans. He hopes American involvement with the College will intensify with time.

Academically, neither Mr. Lawal nor Mr. Kidane has any adjustment problems today. But, recalling their freshman year, they do suggest that revisions in a couple of Stony Brook's freshman courses would help new foreign students who may read the language excellently but speak it only modestly. They say that English 101, required of all freshmen, might be modified for foreign students and that the first-semester course now provided for foreign students should stress conversation more and grammar less.



Ethiopian student Tseggai Kidane

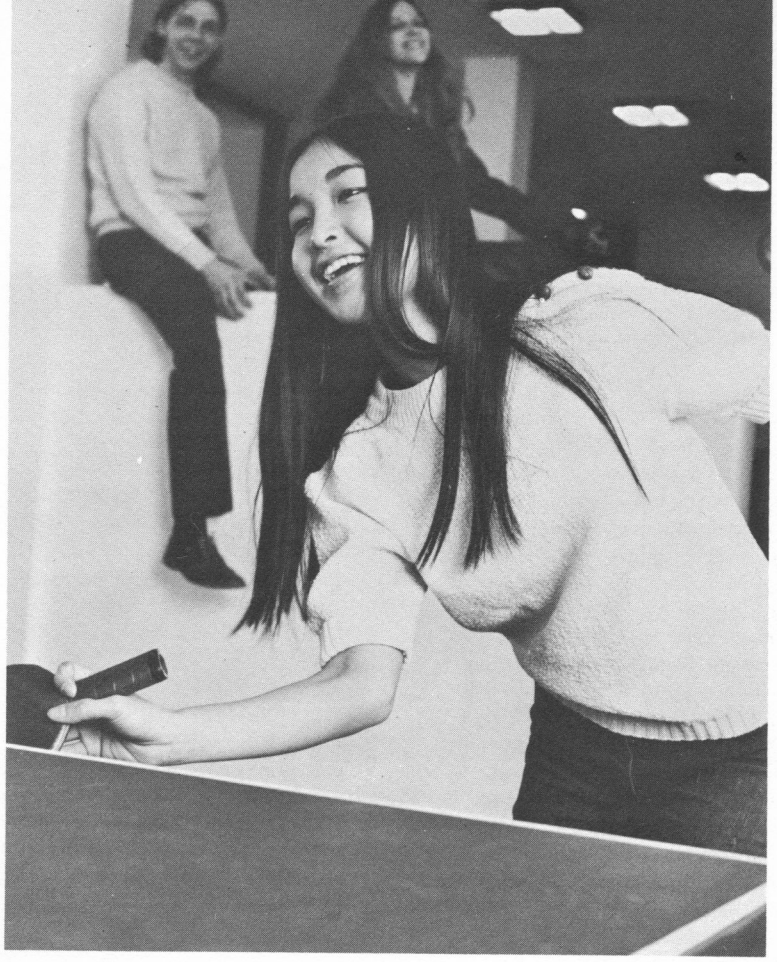
Generally, though, both students attribute any malaise not to Stony Brook — its food, weather or environs — but to the American way of life. They chose Stony Brook over such schools as Cornell and M.I.T. for its location and its reputation for academic excellence. Both men, in fact, are considering staying at the University through their Ph.D. work, which they plan to pursue primarily for the sake of their countries' developing economies.

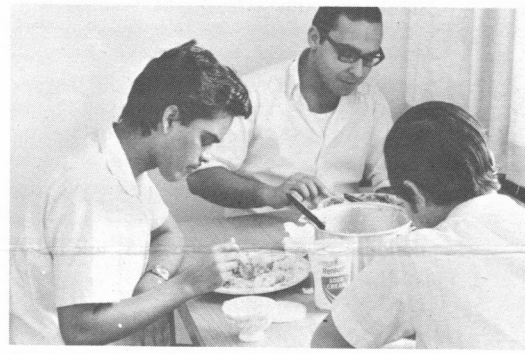
As for America's fast pace and Anglo-Saxon severity — common butts of criticism when foreign students get together — Mr. Lawal and Mr. Kidane believe they can make the adjustment.

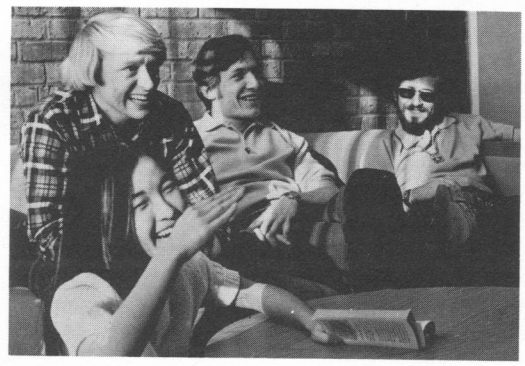
For them and others used to a slower and friendlier life, adjustment would be much easier, Mr. Kidane says, if every foreign student could be assigned a host family as congenial as Mr. and Mrs. William Baker of Smithtown. The Bakers, participating in a program called Community Hospitality for International Students, met Mr. Kidane soon after his arrival. Relaxing at the Baker home and joining them occasionally for dinner, Mr. Kidane says, is a great lift from campus routine and gives him some idea of what American family life is like.

Mr. Lawal says the adjustment could also be eased if more American students would communicate, on more than a perfunctory basis, with their foreign guests.

Both men agree, though, that the International College is a sound, well-motivated idea that, when in full swing, will do much to mitigate adjustment problems and to enrich the lives of both American and foreign students who participate in its programs. — Sam Segal □







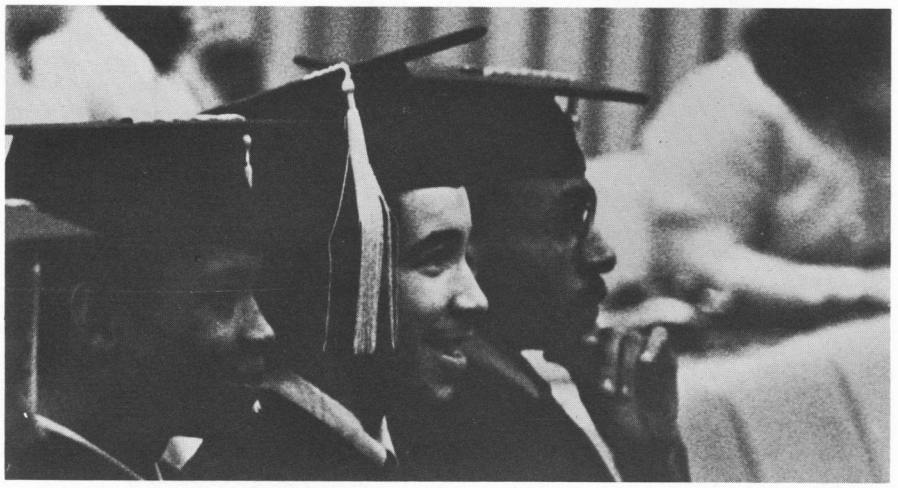
New International Residential College Encourages Intercultural Living

Long Island's only International Residential College opened at Stony Brook this fall. Designed to facilitate integration of foreign students into Stony Brook life, the college has become a campus center for intercultural activities.

Originally in Ammann College, the residential facility moved to the newly-opened Stage XII quadrangle in December, and now houses about one-quarter of the foreign students at Stony Brook. Half of the new college's population is American, to help assure that foreign students come in contact with their American counterparts in daily living, not just in the classroom and laboratory. The International Residential College is also equally divided between undergraduate and graduate students, and men and women.

Ralph Morrison, director of the International Students Office, explained that because there is a waiting list, students who live in the new college will probably have to reapply each year to continue living there. This, he said, will encourage a certain amount of turnover and allow more students to enjoy the experience of international living.

John Fletcher, residential college advisor, said that students are putting a great deal of effort into making the



HEP HEP HOORAY Nine students received their High School Equivalency diplomas at Stony Brook in early February. Some 40 students are currently in the High School Equivalency Program (HEP), designed for migratory and seasonal workers or their children. All nine graduates plan to continue their education and have applied to colleges for admission.

---

college work. He pointed out a Christmas party held there as an example: "Most of the students were busy moving into the college that weekend, but many of the women cooked for the party and the men helped with the decorations and tended bar. Everything went very well." Many of the people attending the party were not residents of the college, but guests, who could sense the friendliness of the residents from the success of the party, Mr. Fletcher said.

"About 90% of the people coming for interviews and applying for residence in the college say they are impressed by how friendly the people they meet here are," he remarked.

An International Coffee House, which had to close its location elsewhere on campus because of a lack of space, will further help to develop a warm atmosphere when it reopens soon in the new college. Weekly coffee hours with guest speakers and informal discussion sessions are planned this semester.

Many residents of the college belong to the International Students Club which has an office in the Stony Brook Union. The club runs several international student activities, including a student speakers bureau which supplies speakers to local schools, clubs and other organizations; an International Student Problem Center which offers foreign students help with a variety of difficulties they may encounter, and International Weekend, a display of exhibitions and festivals which promises to make April 24-25 a highlight of the spring semester. Also planned for April is the club's International Dinner, at which national dishes from around the world will be served.

Last fall, a seminar the club held at the Union brought together students from the Middle East to discuss their differences. Participants in another seminar, on Latin America, heard issues discussed by students from South and Central America. This semester, the International Students Club expects to hold similar seminars on economic problems in India, the future of China and Japan, and Southeast Asian crises.

The club has also sponsored a series of low-cost vacation trips — to Vermont for skiing and snowmobiling, and to the South for a respite from winter cold.

Another foreign student organization, the International Student Organization Executive Committee, includes the leaders of the various nationality groups of foreign students at Stony Brook. This committee, less socially oriented than the International Students Club, seeks to represent interests of foreign students in all aspects of campus life. Rahim Said, an undergraduate sociology major from Malaysia who heads the committee, said current concerns of the group include dietary difficulties due to religious restrictions, academic and financial problems, and family difficulties experienced by some students who don't see their families for long periods of time.

Many of the International Residential College residents got their first glimpse of American family living through the Community Hospitality for International Students (CHIS) program. Started by local residents, the program has been called "one of the best examples of university-community cooperation at Stony Brook" by President John Toll.

New international students meet their host families upon arrival in Stony Brook and live with them until other accommodations are arranged. The students usually keep in touch after their stay with the American hosts. The CHIS families traditionally give an annual Christmas party for the foreign students who have stayed with them. This year, the party was at the new International Residential College, with over 200 people attending. The affair, separate from the holiday party given by the students, was a chance for many students to renew ties with their host families.

An extensive orientation program, designed by the International Students Office, is another major part of a foreign student's introduction to Stony Brook. Students are guided on campus tours, introduced to one another, and briefed on everything from study habits to banking procedures during a 10-day orientation period.

The International Students Office also provides one full-time and one part-time English instructor for students who feel they need brushing up on the nuances of English. Most foreign students at Stony Brook have already demonstrated their English language ability in tests taken before leaving their home countries, but some desire more practice.

Mrs. Susan Chanover and her assistant, Mrs. Joyce Lemonedes, teach English to three 20-student sections of foreign students each semester. "The science students generally have a good command of the scientific language, because much of their technical reading has been in English all along," said Mrs. Chanover, "but they may need some help with conversational English."

Having already demonstrated high academic achievement before coming to Stony Brook, the international students are usually very serious-minded about their academic work and perhaps less socially oriented than some of their American counterparts, said Mr. Fletcher. "There's more pressure on them than there is on our own students. Many of them are married and have families. They feel a responsibility to represent their country well to Americans. They're used to responsibility, so they take their studies here quite seriously." Also, 466 of Stony Brook's 558 international students are graduate students, who are normally older and more mature than undergraduates.

The international student population is larger at Stony Brook than at any other Long Island campus. The Chinese enrollment is 213 (181 from Taiwan, 32 from Hong Kong), and students from India number 142. Fifty-two students represent 17 European countries; 34 are from six lands in the Middle East; 22 come from Canada; 18 from seven republics in Latin America; 16 from six African nations; and four from the Caribbean area.

To help meet the needs of such a diversified group, the International Students Office recently acquired a new counselor, Mrs. Carol Sullivan, a Pembroke graduate who speaks three languages. Mrs. Sullivan will assist Director Ralph Morrison in counseling foreign students on such matters as address reporting required by the Immigration and Naturalization Service, income tax preparation, and other matters. Mr. Morrison and Mrs. Sullivan work closely with Dr. Edwin Battley, master of the International Residential College.

Although still too new to evaluate, Stony Brook's new residential college for foreign students appears to be off to a promising start. "Aside from a few minor problems with the new building, things are going very well," Dr. Battley said. "The spirit is exceedingly good. The living situation here is very pleasant because of the considerateness of the residents."

At a recent meeting held at Stony Brook, foreign student advisors from 15 Eastern colleges expressed much interest in the new International College, which may serve as a model for similar facilities at other institutions. Mr. Morrison, who in addition to his work at Stony Brook is chairman of the foreign student advisors section of Region X of the National Association for Foreign Student Affairs, has received inquiries from as far away as the State of Washington from college officials interested in starting similar programs. □

stony brook review
Office of University Relations
State University of New York at Stony Brook
Stony Brook, N.Y. 11790

Vol. 4, No. 6 February 1971
The Stony Brook Review is produced by the Office of University Relations. Ralph Chamberlin, editor. Published monthly except July and August at the State University of New York at Stony Brook, Stony Brook, N.Y. 11790. Second class postage paid at Stony Brook, N.Y.