StonyBrook Review

2001

Let's Look Ahead to...

Still another thought-provoking and perplexing aspect of the years ahead is probed in this, the third in a series of future-looking articles by prominent Stony Brook faculty members.

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CULTURE IN 2001

by Dr. John Thompson
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I expect by the year 2001, culture, or culture as it has been known, will have died. In fact, art, the arts, "high culture," has already lost its hold on us. We are still wedded, I suppose, us and the arts, but we live with them unaroused, unenthralled. Few of us may be aware of this, as yet, but I think many of us feel it, if only as a rather puzzling boredom or a kind of laziness that keeps us away from the galleries and concert halls and theaters we used to haunt; or we wonder, as our magazine subscriptions lapse one by one why there don't seem to be so many exciting novels and poems appearing anymore.

Here I must interject that I would fight to the death (figuratively speaking) to maintain that we have living among us poets and novelists and other artists

"Movies, television & popular music are diversions like smoking cigarettes."

who will join as their peers, on the slopes of Parnassus, Homer and Dante, Melville and Rimbaud, and their fellows in the other arts as well. But it is not the same, as they themselves will readily acknowledge when they reach their final home among the Muses, and when their ancient peers offer them comfort and manly condolence such as will have been offered to the artists of no other age—nor will any other artists ever have been offered the special crown of bays our artists will have for their unique heroism.

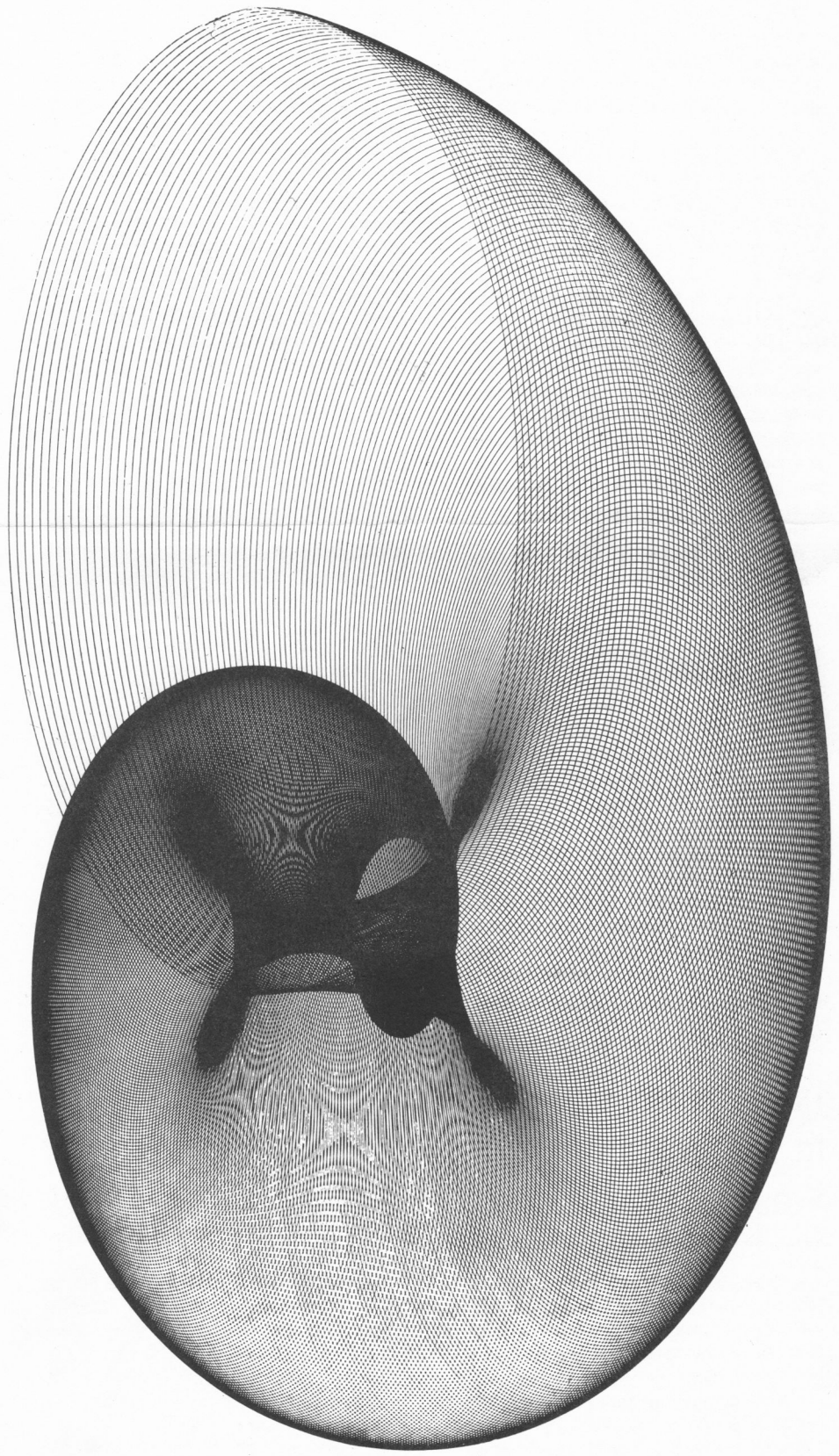
To return: nor do our offspring lust after paintings or sculptures or books of verse or opera tickets the way we did when we were young. I take it that movies, television and popular music are something else, diversions like smoking cigarettes.

I am speaking, of course, only of those of us who really did lust terribly after those things, who, as youths, as soon as we discovered them found the arts to be at least as important as anything else in our lives, probably in fact more important than anything else: much more fixed in our hearts, for instance, much more certainly a part of our future, than any one particular person we might be in love with. For us, marriage, money, family, while probably we wanted these things just as anyone else wanted them, were still things we could have only if the conditions of having them allowed for our pursuit of the arts.

A few artists and lovers of art may in truth still be really as passionate as ever, or more passionate even: there is always a remnant, just as the pygmies may survive our hydrogen war. But isn't there something in the air?

What has seemed eternal does sometimes lose heart and strength and mind, and fail. The best heads of Europe were once passionately engaged in religion, only thus could they live. Some few still are thus engaged. And no doubt there are more churches than there ever were. But since Darwin at least, if not since long before, most religious discussion, most religious art, has been about its losses. Who would claim religion is still a dominant force in the lives of most of us, of wise men, fools, intellectuals, artists, soldiers, governors and governed, as for so many centuries it was, as it was for even the atheists?

Religion there is no need to discuss. The Mass is still celebrated, still commands in some faint degree the services of the arts, as it once commanded



them all and commanded also the allegiance of the state and every other of the then-inseparable items of human culture; but it is over.

There is another part of culture that includes all those things we do to protect humanity against nature. Who would not smile to hear this today? We have been monstrously successful in subduing nature, so successful that we are now terrified of what we have done, and even fear our mortal end through this success, in the steady destruction of the oxygen and carbon dioxide balance of our air, in the poisoning of our lands and our seas. We hear the clamor and are unable to stop what we do.

All now depends on the regulation of the relations of human beings among themselves. But what if the means for doing this have become withered, cut down, trampled, scattered, tossed to the winds?

There is no need to rehearse here the history of the arts, nor could I pretend to do it even if the need existed. Let me depend upon your sense of things. Let me adduce only painting.

Within the memory of men still living the old high arts have blown up in the face of Western civilization. This has come about through the radical transformation of the artist's understanding of his own techniques. As artists became conscious of their own techniques, technique itself became their subject; there was a gorgeous brief consuming efflorescence, a pyrotechnic explosion; and then it was over.

Picasso and Braque, and then after them everyone, saw not that nature consisted of cubes, cones and cylinders, but that painting consisted of the surface of the painting. Giotto, the cave-painters of Lascaux, the sculptors of Benin and of New Guinea, knew that their art demanded structure and design of the surface. All artists have always worked in cubes and cylinders, in arabesque and in coil. But around 1900, everything changed, and painting burst out in a period of magnificence unequalled since the Renaissance. Picasso recapitulated the history of art, in homage and parody; and strangely, the new separation of technique from subject allowed also a new freedom

> "The old high arts have blown up in the face of Western civilization."

in subject, a new return to a kind of "literary" painting, as in Surrealism. And then it was over. As we so often say, we have something now, but it is not painting.

Surely something happened with the novel as it did to painting: the refinement of technique (Flaubert) and then its isolation (Joyce), and then a great flowering — and then, something else. Commonplace, too, to say that when poets came to know only too well that poems are made of words, not of ideas, there was a flowering, a recapitulation, a fragmentation of brilliant pieces, and then — well, it would be too complicated to argue the case, if you do not sense it. We have brilliant poets, even great poets, I believe: perhaps because their medium is language itself, because language has not yet quite yielded all its secrets — language, the first and deepest and most necessary element in the pact we call human culture — poets still have a precarious authority.

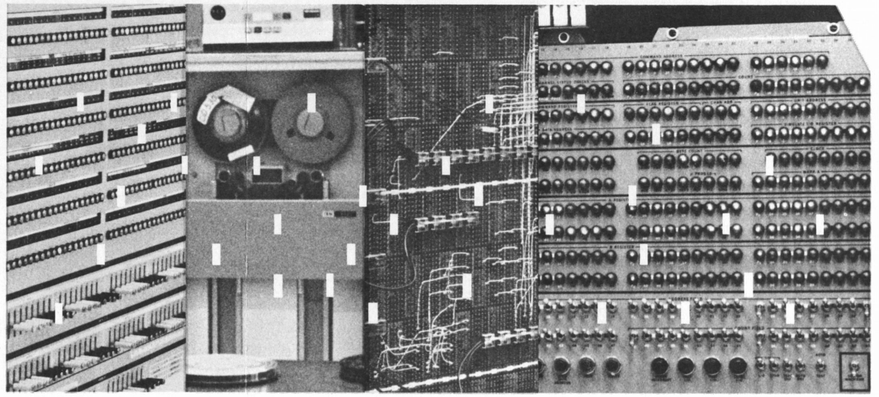
When have people ever been so aware of their inheritance of cruelty, of their daily cruelties, their unending prospect of cruelties to come? No, this is not the Thirty Years War, most of us are secure, secure day by day in our unprecedented peril. But when have there ever been such universal agonies of guilt? We are riddled with guilt, to speak now only of Americans, leaving out of account the overwhelming guilts of Europe — but they are used to it. We are all aware now, as so few people were at the time, of the horror in our deliberate genocide of the American Indians from coast to coast. We live in horror of what we have done to the descendants of kidnapped Africans. Who ever before felt so much pain about his own history?

We are riddled with guilt about our poverty and about our riches, about our victories in war and our defeats, about crime and about our punishment of it: about smoking, drinking, all our addictions, about sex. There seems to be nothing we are not told to feel guilty about and we respond always to these instructions, even if it is only to bluster that we are sick of it, we refuse to feel guilty. We are ashamed of our countryside and of our cities; in both we are drowning, as we did in our schoolboy jokes, in our own "effluent." We are guilty about our nurseries, our schools, our highways, our office buildings and our dwellings, our hospitals, our homes for old people, our funeral parlors. We are told to feel guilty about the manner in which our leaders persuade us to vote for them, and we do feel guilty about it. We are ashamed of our President, and our flag is a worldwide emblem of disgrace.

Who else ever suffered so much while growing fat on plunder from poor countries? Who else ever made a continent ugly and then suffered such dreadful remorse for it, a paralyzing remorse with no remedy? Our guilt is like a disease of the bone that makes every movement an agony, and so we cannot move.

We might wish there could be something to be salvaged from this confrontation we are having with our own human nature, some being to salvage it. Who will take our guilt and allow us to grieve and then to rejoice and be free? But we can only talk, and talk, and talk. And talk. □

THE COMPUTER ON CAMPUS



How are stars formed? Why are our most careful economic forecasts often wrong? How can New York City's garbage collection be improved while still giving the collectors more weekends off? When will color equilibrium be reached between America's darkening white population and lightening black population? What are music's limits when its sound range is limitless?

These are a few of the questions being explored with the help of the Stony Brook Computing Center's 360-67 computer — a machine that demands eternal 70-degree temperatures and 40% humidity, costs $55,000 a month to rent and annually consumes $36,000 worth of paper, punch cards and tape in its relentless annual production of 260 million printed lines of information.

Quantitatively, the computer's prowess mocks even the proudest human achievement. Its unimaginable speed in acting on man-supplied data is what makes it seem super-human. The 360-67, which is only moderately large and quick as computers go, can complete 400,000 separate additions of two nine-digit numbers in one second. The most deluxe commercial models operate about 15 to 20 times faster, have a 20-fold storage capacity and carry a purchase value more than triple the 360-67's $3,000,000 figure. At least one experimental computer works about 200 times faster than Stony Brook's — performing 80,000,000 additions in a second.

Qualitatively, however, the computer is bound by the resources of its human masters. GIGO — the acronym meaning Garbage In, Garbage Out — reflects the insiders' understanding that a computer is but a tool of man, fashioned by him and dependent on his ingenuity.

That is why many of the machine's users have already grown blase about the computer's power to produce marvels. They see it chiefly as a time-saver, performing in a flash what would otherwise take men years or, in some cases, more time than the life-span of the researcher.

The Computing Center, on the west side of the Engineering Quadrangle, is the place where all this time is being saved.

Directed by Rex Franciotti, the Center employs 26 programmers and managers, 10 computer operators, 7 key-punch operators who ready data for computer-digestable cards, 3 clerical aides and 3 stenographers. They annually serve 1500 undergraduates, 175 faculty members and 150 graduate students who, together, are working on more than 175 currently active research projects as well as many short-term special projects, computer-training programs and an endless flow of administrative data processing. The administrative workload ranges from billing to up-to-the-minute analysis of budget outlays to keeping track of work-orders and machine parts. The Center's computer is also used to aid Long Island government planners and University units involved with the community. These include the Technical Assistance Office, which links campus research and knowledge with Long Island commercial and industrial managers interested in applying that research and knowledge.

The Center's heart is the computer room.

It has an aura of science fiction — with tapes spinning on their reels, lights blinking and a pervasive soft clicking sound suffused by an electronic humming. The room is 80 by 40 feet with a 14-foot-high ceiling seeded with bright fluorescent lights. The floor, beneath which lies a thick maze of hidden cables, has a pattern of white squares with black borders; and the machinery is a soothing combination of sky blue, white and black.

The computer itself — the central processing unit, the "brain" — is a modest-sized cube in the center of the room. It is about six feet high, eight feet deep, three feet wide and has blinking buttons on its face.

Behind it, a little like oxygen tanks on the back of a deep-sea diver, are three core-storage units, each about the same size as the computer itself and each bearing 2.5 million ferromagnetic "donuts" crammed with electronically coded information. Core storage is the threshold to the "brain," the last stop for information on the way to computer processing. And the stop is brief. In less than a millionth of a second, any material within core storage can be located and fed to the computer itself.

The three core units together can contain, or keep "on line," up to 785,000 characters. Each character comprises eight binary bits. These bits are the fundamental positive and negative electric charges that the computer adds, substracts and compares to work all its wonders.

Some core storage capacity is left open for input from other areas of the computer room. From what looks like a head-high, circular display case but is actually a high-speed drum storing 4,000,000 characters of information, the core storage area can be supplied with 1,300,000 characters of data per second; and any of that information can be located by the system in 8.5 thousandths of a second.

Another source that can be put "on line" to core storage is what Mr. Franciotti calls the pizza ovens. Into each oven — there are 16 in the room — an operator may place any of the 28,000,000-character disc packs that are stored nearby. Each of the 40 packs, resembling round cake-molds, is grooved with 4000 circular tracks, from which any stored information can be located in 85 thousandths of a second and transmitted to core storage at the rate of more than 300,000 characters per second. The computer's core-storage units can also be fed by tapes or supplied by a card-reader, a machine that takes processed punch cards and converts their messages into electronic impulses. Besides tapes kept on line for current projects, the computer room has a 1000-reel library. The 2400-foot tapes are the most economical long-range storage devices and are used for the full range of computer projects.

Several Stony Brook departments — including those of chemistry, computer science, earth and space sciences, physics and psychology — have their own, small computers, with purchase values ranging from about $50,000 to $500,000.

The Instructional Resources Center has a 1500 model computer specially suited to the IRC effort of developing computer-assisted-instruction courses, which it does in areas as diverse as German language, dental anatomy and English composition. However, the IRC calls on the Computing Center's larger machine to help devise programs for its own computer.

There is also, in the Health Sciences Center, Stony Brook's single Remote Job-Entry Station. It has a card-reader and printer allowing input at the Health Sciences Center to be processed by the 360-67 and instantly responded to with high-speed printouts. There are also on campus 24 typewriter terminals, from which users may type their problems into the 360-67. With these, though, responses are slower — returning at typewriting speed.

Physics, Health Sciences and other University units may also make their own connections, via telephone lines, to special-purpose computers. Health Sciences Communications, for instance, as part of the SUNY Biomedical Communications Network, uses a typewriter terminal to find from a Syracuse data bank all kinds of reference material on medical research, computer-filed by title and subject. Health Sciences has also made some use of computer symptom-analysis done by a New York City computer and has various additional plans for medical analysis — including that of electroencephalograms and electrocardiograms.

Except for these off-campus links, however, most of Stony Brook's complex computer work is done with the Computing Center's 360-67. A look at some current projects indicates the powers of the machine.

"Without the computer, my work couldn't be done at all — no matter how much time I'd take," says Professor Herman O. Stekler of the Economics Department. Dr. Stekler, a consultant to the Federal Reserve Board, has been working for two years on problems of economic forecasting. He and a half dozen students, using a computer model that involves some 150 equations to describe all phases of the national economy, compare actual economic developments with what was forecast in the 1960's. The work is aimed at yielding more accurate models and hence better forecasts in the future.

Another down-to-earth use of the 360-67 has been to help devise more efficient deployment plans for New York City's sanitationmen. Professor Robert Nathans, chairman of the Urban Science and Engineering program, quickly supplied the city and the sanitationmen's union with practical proposals regarding work schedules, truck use, incinerators and other matters bearing on the efficiency of city garbage collection. He was able to suggest a plan that would save the city millions of dollars — with the same size workforce — and also give the men more weekends off than under their old schedules.

Less mundane pursuits also benefit from the computer. Assistant Professor William Gebel of the Earth and Space Sciences Department beams an Arizona telescope at gaseous clouds surrounding remote, young stars. Then, back at Stony Brook, he puts the data through the Stony Brook computer "which takes a few minutes to do what would otherwise take years." The gaseous clouds, which no longer surround mature stars, still contain secrets about stellar birth; and the computer analysis should contribute to unlocking those secrets.

George J. Hoffman, a graduate student in ecology and evolution, has been using the 360-67 for a project that seems much humbler but could be just as fundamentally significant to science. He works with butterflies. His field is numerical taxonomy, classifying organisms by numbers rather than by less-precise names. Numbers allow almost endless subclassification, something like a Dewey decimal system for plants and animals. Mr. Hoffman is specifically trying to "teach" the computer to make its classifications simply by scanning photos of the organism. First he fed in data on butterflies and correlated that data with photos that passed through a scanner. Subsequently, the computer was able to feed back classification data merely from photos. Thus far, his programming has dealt only with papilio butterflies, which are almost two-dimensional and thus easier to work with. But the long-range prospects for photo-classification are almost unlimited.

Another kind of pioneering classification work is being done by Professor Jack Heller of the Computer Science Department, who for two years has been developing a comprehensive computer code for art objects. The system, involving a dozen leading museums, including New York City's Museum of Modern Art, would eventually provide an instant printout on virtually everything known about any work within the system of participating museums.

Another of the Computing Center's art-related efforts is being pursued by David Lewin, an Associate Professor in the Music Department and one of about a dozen classically trained and proficient American musicians who are producing computer music. Mr. Lewin took his bachelor's degree in math from Harvard and his master's degree in music from Princeton. While he still

Computer Science Dept. Begins Operations

The Department of Computer Science, under the chairmanship of Dr. R. B. Kieburtz, was organized during the current academic year.

On the undergraduate level, it offers a major with courses in programming and in the inner workings of the computer.

An M.S. degree program, designed mainly for future computer professionals, covers programming, computer systems, methodologies and experience with computer-related problems.

The Ph.D. program, which probes the more theoretical aspects of computer science, is planned chiefly for students with academic and research interests.

Active research areas listed by the department include artificial intelligence, theory of computation, systems programming, computer networks, computer graphics, image analysis, pattern recognition, textual data banks, digital systems and switching theory.

The department, which is within the division of Mathematical Science, has its own PDP 15-40 computer, which serves chiefly as an instruction aid. For complex work requiring great speed and data-storage capacity it makes extensive use of the Computing Center's 360-67 computer. □

loves to hear and play classical music, he has begun composing with the computer, a genre his colleagues respect without quite comprehending. What such work will mean to the future of music no one can predict, for the sound range and combinations afforded by the computer are almost literally infinite — limited only by what "notes" and sounds the musician-programmer can elicit from the machine.

History and sociology, like all other academic disciplines, are also benefiting from the computer. Just one of several computer uses made by Stony Brook's Institute for Colonial Studies is a project to create data archives on the career, biographical and voting records of 1500 legislators in post-Revolutionary America.

In a project bridging biology, history and sociology, graduate student Patricia Shaffer, under the sponsorship of Biology Professor Elof Carlson, has been exploring human melanin (skin pigment) inheritance, in relation to black-white miscegenation dating back to slavery days. "If we know the frequency with which white-black couples have offspring," says Dr. Carlson, "and we know the frequency with which such hybrid offspring pass into the white community or the black community, we can calculate when a black and white equilibrium will be reached." Current data indicate, he says, that in three to five centuries, America will be between 50-75% white, with the rest of the population a light shade of brown or tan, a shading similar to that of an average Spaniard or Italian.

As with research projects, administrative work may be so hastened by the computer that the difference seems qualitative. Besides saving time on routine data processing, the Center produces innovations like a fully computerized circulation system soon to be inaugurated in the Melville Library. With such new systems, says Fred Abeles, manager of the Computing Center's Administrative Data System group, new levels of managerial and analytical work are possible. With instant and abundant information on who has which books, how long they are usually kept and for what purposes, library administrators can better plan their future operations.

In general, the wonder of the computer is that its mind never boggles. Nothing is too complicated and no glut of data too much as long as the users can translate their concerns into the number-based language the computer understands.

An irony is that few people understand the computer.

Mr. Hoffman, the butterfly researcher, expressed a common attitude of its users when he said: "To me, it's like a black box. You feed in your program and get your results. It's pretty much like a television set that you turn on. I'm not really interested in what goes on inside it." — Sam Segal □

New College Centers Offer Adults Special Opportunities

Above a municipal bus terminal, on the second floor of an aging office building and in high-school and middle-school classrooms, lights burn late into the evening.

The reason is an unusual educational program operated by Stony Brook whereby four mini-colleges are brought to the people they serve. Early reports indicate marked success.

To the evening classes in rented downtown space come professors from ten public and private Long Island colleges and universities. Their courses are essentially what they teach on their home campuses — arts, sciences, social studies and special services — with additional remedial training to suit their students' individual needs. The students, whose median age is 25, are working mothers and fathers and anyone else who has been out of education's mainstream for a time but now wants to return at the college level.

To facilitate their return, the State University has launched Cooperative College Centers (CCC) to "make it possible for mature, highly motivated persons to obtain a college education even though they may be poor, or their secondary education may have been deficient in preparing them for admission to a typical college," in the words of SUNY's Associate Dean for Special Programs, Dr. Emilio Rivera, Jr.

Students are usually required to have a high-school diploma or equivalency certificate. Under optimal conditions, a year of CCC training qualifies them to be college sophomores.

CCC's, some of which opened in the 1969-70 academic year, are now based in six areas statewide, including both Nassau and Suffolk Counties. Though Nassau is technically one base area with one center and CCC program, that program is actually offered through three separately run units — at Glen Cove, Hempstead and Roosevelt. The Suffolk program, for the time being, operates as a single unit, in Wyandanch. This was the only CCC program on Long Island to have begun in the fall of 1969, a year before the other three.

The State University at Stony Brook became fully involved last summer. Dr. Francis H. Palmer, Provost for Educational Research and Development, has overall administrative responsibility for all Long Island Cooperative College Center campuses.

"It's one of the most exciting programs we've got going," says Provost Palmer whose responsibilities include a variety of educational and instructional programs at Stony Brook.

Noting that Wyandanch is the only Long Island unit that has been in operation more than one semester, Dr. Palmer says:

"It's still too early to make sweeping judgments; however, it seems to me that the Cooperative College Centers will become a major avenue for disadvantaged people to enter colleges and universities, particularly the State University system. The centers satisfy a need; they reach people who aren't usually touched by on-campus programs but who have the maturity, motivation and self-reliance to do college work."

A clear measure of the need is the response. Final first-semester enrollment included 172 students at Glen Cove, 359 at Hempstead, 319 at Roosevelt and 714 at Wyandanch.

Dr. Palmer's overall director for the four CCC units is Jerome Ziegler, Vice President of the State University College at Old Westbury and director of the Wyandanch center in 1969-70.

"It's an enormous jump," Mr. Ziegler said, "from the 230 students who began at Wyandanch in October 1969 to the 1564 enrollment total this year. The registration was considerably higher than anticipated, though I'm of course delighted with that."

This semester, Dr. Palmer says, several hundred additional applications have been received and final, official enrollment is expected to show a significant increase. Thus far, no qualified applicants have been turned down.

The strong public response required the Hempstead unit, initially housed on the second floor of the Hempstead Bus Terminal, to rent additional space in the second story of an office building, even before the first term was completed. Secondary space is also being considered, Dr. Palmer said, for the Wyandanch unit, to which some Suffolk students now travel 50 miles for their evening classes.

Mr. Ziegler said the average work load is between two and three courses per student and, he added, "the students generally have the discipline and desire to work. They've been out of school and are very appreciative of the opportunity to get back. They are preparing themselves for two- and four-year colleges; several are entering pre-nursing or social-work areas."

University-wide austerity is requiring some trimming of the Long Island CCC's budget of $1,073,000. However, Dr. Palmer said recently, "any cuts as a function of the Governor's freeze will not lead to cuts of faculty hours or to increases in class sizes," which have averaged 16.3 students in Nassau and 18.5 in Wyandanch.

There are, nevertheless, other money problems awaiting long-range solutions. For one thing, CCC has not yet been established as a permanent, annual budget item, which lends an element of uncertainty to any planning. Also, according to Dr. Palmer, CCC "graduates," who may be ready for school at regular campuses after a year or more of diligent preparation, are going to require realistic financial-aid provisions designed for mature adults with families.

Stipend arrangements and more flexible means for mature, working adults to accumulate college credits relatively quickly are among the major concerns of Mr. Ziegler. Dr. Palmer's concerns include stabilizing the arrangements under which participating institutions supply CCC faculty members. Those arrangements are presently left largely to the individual schools, which include, besides Stony Brook, Adelphi University, C.W. Post College, Dowling College, Hofstra University, Nassau Community College, New York Institute of Technology, State University units at Old Westbury and Farmingdale, and Suffolk County Community College.

In sum, Dr. Palmer says, the program does have problems, but seems clearly to be viable, popular and successful.

"At the very worst," he says, "the students will end up with a better chance for job opportunities; at best, they'll enter college as sophomores after a year at the centers." □

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