

Stony Brook

REVIEW

It's a bird.

It's a plane ...



No... It's Super Star!

If you miss it this time around, it'll be back this way again in another 800,000 years or so

Note: The comet pictured on the cover is actually Mrkos Comet, photographed in 1957 by Mount Wilson and Palomar Observatories.

Astronomers in the earth and space sciences department on campus are studying the holiday treat of a lifetime. Kohoutek, the "Christmas Comet," in a near-rendezvous with the sun, is providing a rare astronomical spectacle, rivaling that of the famed Halley's Comet.

Several earth and space sciences faculty members have been giving talks about Kohoutek and studying it closely for clues to the basic nature of the solar system.

Comets are part of the very farthest reaches of the solar system. They travel around the sun in orbits much like the earth's but thousands of times greater. Halley's Comet, with a small orbit as comets go, takes 76 years to travel round the sun, compared to the earth's year-long orbit. Thus, some people who saw Halley's back in 1910 will see it again in 1986. The distances traveled by Halley's pale by comparison with Kohoutek which is not expected back this way again for hundreds of thousands of years.

Comets apparently were formed at the same time as the rest of the solar system, some 4.5 billion years ago. Their great distances from the sun and resulting low temperatures are believed to have preserved their component substances in pristine condition, thus making any comet that moves into the inner solar system a kind of space ship bringing ideal materials for scientific analysis. Clues brought by such comets could lead to improved understanding of how the planets, and perhaps life, began.

Kohoutek is named after Dr. Lubos Kohoutek, an astronomer who discovered it at an observatory in Hamburg, Germany last March. The comet then was about 400 million miles from the sun, just beginning its orbital swing toward the inner solar system. It became visible in the pre-dawn skies to the naked eye a few weeks ago appearing about as bright as the dimmest stars as it closed to within less than 100 million miles of the sun. However, the best, or at least most convenient, viewing times are expected to be after December 28 when Kohoutek comes within 13 million miles of the sun, passes it, and then enters our western, post-sunset skies as it begins its long trek back to outer space, traveling trillions of miles away from the sun in a huge orbit that should bring it back our way in some 800,000 years.

Five members of the earth and space sciences department constitute an informal "Kohoutek Task Force" that has been watching the comet's approach. They are Dr. Donald W. Goldsmith, Dr. Barry Lutz, Dr. Tobias Owen, Dr. Deane M. Peterson and Dr. Michal Simon. Drs. Goldsmith, Owen and Simon have presented two special free public lecture programs on Kohoutek this month.

During December and January, Drs. Lutz, Owen, Peterson and Simon, along with graduate student Giovanna Righini, will be conducting a variety of spectroscopic and infra-red experiments, analyzing molecular light emissions from Kohoutek.

The nearness of this very bright comet will offer unprecedented opportunities for close study of its light emissions. Some astronomers will be conducting telescopic studies of the light that millions of laymen will see, that is, the sunlight reflected from the gas, dust and ice particles that make up the comet.

The Stony Brook group, and most other astronomers, will be more interested in a different kind of light from Kohoutek, the minute quantities emitted from the molecules of gas in the head and tail of the comet. They'll examine this molecular light with a spectrograph, an instrument that spreads light out into a spectrum made up of various wave lengths, each with its own distinct color. The molecular light emissions will break down into very subtle but distinct colors on the spectrograph, with each color corresponding to a particular substance or an energy process within a substance. As a result of Kohoutek's brightness, they expect that this spectrographic analysis will be based on more molecular light than has ever before been possible with a comet, provided the amount of dust produced by this comet is not excessive. This should make it possible to detect minute quantities of substances that astronomers have until now only suspected in comets.

This opens an exciting prospect of verifying theories about the role of comets in the solar system's formation, theories that have resulted from the plethora of related astronomical discoveries during the last few years. Scientists suspect, for example, a relationship between meteors and comets. About two years ago, amino acids were discovered in meteorites. Should these basic building blocks of life also be found in Kohoutek, it will lend credence to theories about the existence of life in solar systems.

The last days of December are crucial times for astronomers. As Kohoutek reaches its closest distance to the sun, it will be at its brightest. Unfortunately, the comet will be very difficult to see with the naked eye then, due to the sun's interference. However, as the new year begins, the comet should be providing a spectacular cosmic display, beginning shortly after sunset each day through late January. It will appear slightly smaller each day as it heads away from the sun, but for a while in January it may extend across a fifth or more of the night skies. There is even a possibility that it may be visible during daylight hours. However, Dr. Owen cautions, "We've never experienced a Kohoutek before, and it could be a great disappointment. Comets have a way of behaving unpredictably, sometimes even breaking up and disappearing as they approach the sun."

Nevertheless, Dr. Owen and some of his colleagues plan to be at major observatories in Texas and Arizona in January. Some portable three- and six-inch telescopes are being readied for rooftop observation from the earth and space sciences building on campus. And, if there is enough interest, the Kohoutek group will repeat its December talks during January, incorporating opportunities for visitors to observe the comet telescopically. ▼

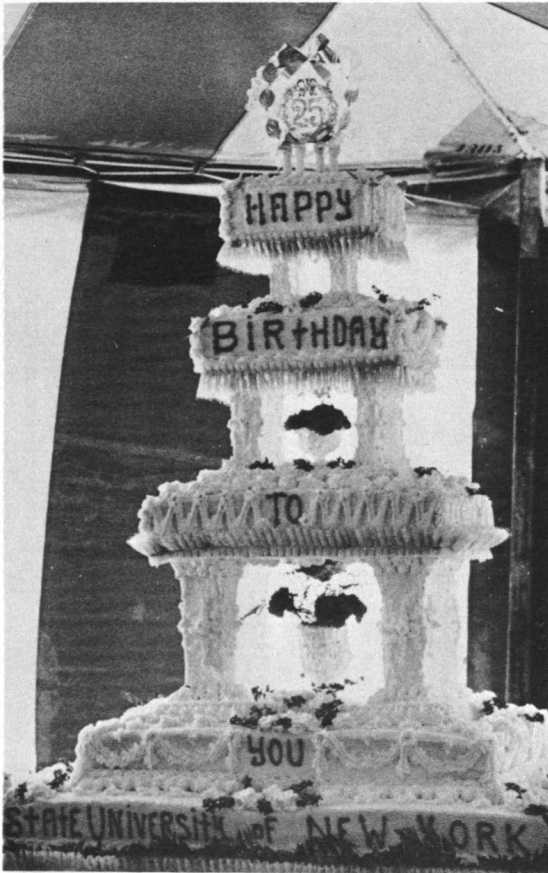
Campus Open House Drew 7000 People

The Open House, held at Stony Brook October 13 to celebrate the State University's 25th anniversary, drew about 7000 people to the campus for a day full of music, exhibits, demonstrations, tours and entertainment. The day's success was greatly due to the voluntary cooperation of hundreds of faculty, staff and students.

Most of the other 72 SUNY campuses also sponsored open houses on the same day. More than 100,000 New Yorkers visited one of the campuses of the State University for the occasion, making it the largest State University event ever held.

At Stony Brook, the attractions which drew the most attention were the moon rocks displayed by the earth and space sciences department, the campus bus tours, and the quarter-ton birthday cake. Other popular events were the computer-assisted instruction demonstrations, the Instructional Resources Center's live color TV broadcast of the Stony Brook Jazz Lab, the bone museum display, Arvell Shaw's jazz program in the entertainment tent and the University Chamber Orchestra concert. At least two dozen other events attracted interested visitors as well.

Suffolk County Executive John V. N. Klein and Nassau County Executive Ralph G. Caso were honorary co-chairmen of the Stony Brook Open House Committee. A number of other community leaders served on the committee. These included: State Senator Leon E. Giuffreda, Assemblyman Peter J. Costigan, Assemblyman Robert C. Wertz, Brookhaven Supervisor Charles W. Barraud and Smithtown Supervisor Paul Fitzpatrick. ▼



A SUNY birthday cake weighing a quarter of a ton was baked by Lou Tritsehler of Suburban Bake Shop in Glen Cove and contributed by the Central Federal Savings and Loan Association. The recipe called for 175 pounds of sugar, 50 pounds of flour and 45 pounds of butter. The cake stood 5' 10" high and was more than 300 pounds heavier than Princess Anne's November wedding cake.

UFO's:

Upstarts From Outer-space, or Unrestrained Fantasy Objects

Recently Long Island has witnessed a flurry of reports of sightings of unidentified flying objects.

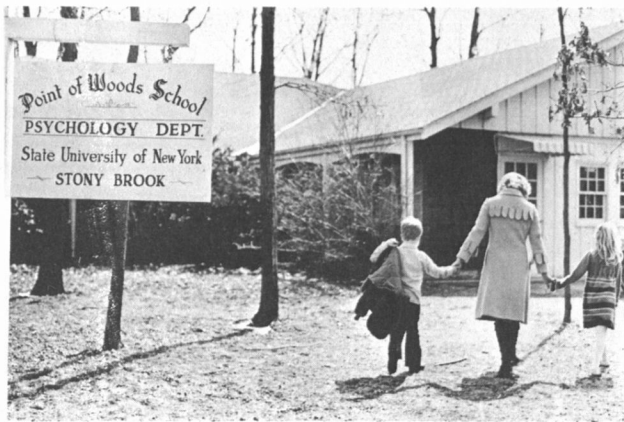
Dr. Tobias C. Owens, professor of earth and space sciences, offers one explanation: "It is certainly possible that the news of the impending visit from the comet caused people to start looking at the sky after not paying much attention to it for awhile, and when that happens past experience indicates that 'things' are seen, many of them not at all understandable to the viewer."

Dr. Barry Lutz, research associate in earth and space, says that UFO sightings fall into three categories: those that can be attributed to cranks, those that can be explained as known phenomena, and those that cannot be explained and about which scientists must keep an open mind. He says, "99-9/10% of the sightings are either crank or explainable." The chances are high, he says, that life exists in other solar systems in our or other galaxies, but the chances are low of beings reaching us.

Dr. D. W. Goldsmith, assistant professor of earth and space sciences, says, "Since it is quite

likely that many stellar systems in our galaxy have highly developed life forms (using our own solar system as a paradigm), most astronomers believe in the probable existence of other civilizations. But a visit takes great effort (it is millions of times farther from one star to another than from here to the moon), and a visit to us requires either a huge number of civilizations with little else to do but travel, or belief that we are somehow special and interesting."

"It is my feeling," says Dr. Owen, "that science has little to offer in the way of a resolution of the UFO problem as it is presently posed. The reason is that, in spite of all the sightings and reports, the raw data that describe the phenomena are basically too poor to permit a rigorous analysis to be carried out. Under the circumstances, it would be extremely unwise for scientists to dismiss the entire problem as being totally unworthy of their attention. Rather, one would hope that minds will remain open and that efforts will continue to be made to identify and understand all of the various phenomena reported as UFO's." ▼



Children Get Help At Point of Woods

Behaviorism may be a key to a more productive life for millions of Americans or a harbinger of an era of big brother control through psychological programming. Whether it is viewed with dismay as a tidal wave or dismissed as just another ripple, behavior therapy seems to be the new wave, and is being practiced by some of the most respected names in modern psychology.

Spearheading Stony Brook's behavior research is Dr. Daniel O'Leary, a member of Stony Brook's psychology department and director of the Point of Woods School. Dr. O'Leary leads a team of teachers, clinical psychologists, a physician, graduate students in psychology and parents who help kids having trouble making it in public schools learn to control certain "target behaviors."

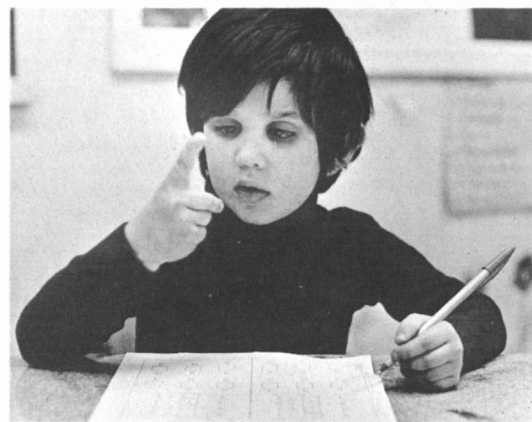
"We don't go back into what is called the Oedipal phase, ages 1-5, rather emphasis is on problems right now. We will get a quick history of how a person came to be troubled, and then we formulate a program of behavior therapy to deal with the problem.

"Consciousness and anxiety are two examples of problems that can't be seen, yet behavior modifiers deal with them. The behavior therapist applies learning and social influence principles, such as persuasion or empathy, to change the problem behavior. If the patient is an adult, he or she identifies the target behavior and expresses a desire to change. When the patient is a child, a decision is made in conjunction with parent and teachers."

Three different programs come under the Point of Woods umbrella: (1) The laboratory school itself which is partially funded by tuition from the Middle Country School district in Centereach and a grant from the U.S. Office of Education, (2) a field project financed by the National Institute of Mental Health involving consultation among four clinical psychologists and parents and teachers at the home base elementary school where a child is having problems, and (3) a field project involving hyperactive youngsters who are taught to control the behaviors that prevent them from concentrating and learning. This experiment has given parents a viable alternative to drug therapy without the reduction in growth and loss of appetite sometimes found in children taking amphetamines.

The laboratory school brings in eight youngsters, and eight control children remain in their regular elementary schools. The eight children who attend the laboratory school are immediately introduced to the system of "token economies," or prizes given out for positive behavior. The morning teacher, Marlene Schneider, has been taught to ignore "bad behavior" and to recognize even the slightest move toward "good" behavior.

"Take, for example, one little boy I will call Skip. His 'target problem' was not keeping his hands to himself. He could not get more than 15 minutes work done in a day. Whereas in his regular school his aggressive behavior had attracted considerable attention from his teacher, here this behavior was ignored. He saw other children earning candy and small prizes for their 'good' behavior. We taught him to go into what we call a 'turtle position' whenever he got the urge to



strike out. This meant putting his head down on his chest and bringing his arms up, bent at the elbows, to his chest. We heap praise on the children at the first sign that they are trying to cope with their problem, and in most cases, as in Skip's, we are extremely successful."

In April this year, after seven months at Point of Woods, the children will be returned to their regular classes. In previous years, children would occasionally revert back to their original behavior problems when the token reinforcement program was removed, but this was overcome when the Point of Woods School instituted a very gradual removal of the token economies as incentives for behavior. Praise, peer acceptance and attention from the teacher take the place of prizes by the end of December.

Marlene Schneider now has a teacher, Eleanor Wilcox, to take over the class at Point of Woods in the afternoons while she makes house calls to check on the progress of graduates from a year or two before. According to Dr. Susan O'Leary, acting director of the laboratory school, for the most part, they are doing quite well.

In the consultation project, clinical psychologists with special training in behavioral principles go into the district where a child lives. In conjunction with parents, school officials and the particular teacher, a program is worked out to help the child improve and control his own behavior. The principle is the same here as in the laboratory school, except that children are not taken out of their regular classes. Like the laboratory school, the consultation program, coordinated by Dr. Daniel O'Leary and Dr. Ronald Kent, has proven quite effective and dramatic changes in school performance have often resulted.

The field project for hyperactive children was led by Dr. Rolf Jacob, a Swedish M.D. who is specializing in child psychiatry. The project was funded by two grants from Swedish philanthropies as well as a U.S. Office of Education grant, and a Biomedical Science Grant.

Although its detractors see behaviorism as a tool for parents of good and not-so-good intentions to program their little boys and girls as doctors, lawyers, or Indian chiefs, the service performed at the Point of Woods School goes beyond ideology or theory. It gives children who otherwise might be left back, ostracized or socially crippled, a second chance. "We want to help the children get rid of their problems so they can be productive, happy and free to pursue their own academic and social goals," Daniel O'Leary remarked.

The Point of Woods School has recently been written up in *Newsday*, the *Baltimore News American* and the *Washington Post*, and scholarly articles about projects emanating from the school have appeared in numerous professional journals. ▼

FROM NOISE TO MUSIC Electronic Music at Stony Brook

Eerie sounds emanate from the speakers. Shriill tones. A low frequency beating. Tones merging, crashing and together forming an intricate pattern of sound, a complex aural tapestry which alternately soothes, then jars, the ears of the listener.

The source of this auditory sensation is electronic music, a relatively new art form being explored by composers such as Bulent Arel, professor of music.

Composers of electronic music in its pure form, Prof. Arel says, do not attempt to imitate the sounds of conventional instruments, but employ the uniquely colored sounds produced by modern gadgetry to create music in much the same way as a classical composer blends a variety of instruments.

Before getting into electronic music, Prof. Arel composed a substantial body of music for conventional instruments. Since coming to the United States in 1959 as the recipient of a Rockefeller research grant for work at the Columbia-Princeton Electronic Music Center, he has concentrated on the composition of electronic music.

Born and educated in Turkey, Prof. Arel taught music there, and later served as musical director of Radio Ankara. Prior to coming to Stony Brook, he was associate professor of music at Yale University, where he designed and directed the Electronic Music Studio. He recently completed the construction of an electronic music studio on the Stony Brook campus, a project which has taken three years.

The studio bears little resemblance to typical recording facilities. An array of sophisticated electronic equipment enables composers to create their works with care and precision. A key item in the lab is a Buchla Model 4 synthesizer. It is a particularly complex piece of equipment with dozens of knobs, switches and input and output channels to create and control a wide variety of sounds and patterns.

"There are very serious technical problems to overcome in working in this field," Prof. Arel says. "It takes a long time to master the technique, and even then it's easy to produce sounds, but much more difficult to evaluate the raw material."

"Basically we stress a classical studio technique," says Prof. Arel. "We originate the sounds, not just synthesize them. Of course, not all sound is music. At Stony Brook we feel that a classical training in music is essential before attempting to compose electronic music. Electronic music is taught as part of the "Advanced Composition" course because it is actually just another form of orchestration or instrumentation. In this way, we keep the lab from becoming a hobby shop." ▼



Working with electronic music opens a whole range of sound colors and very complicated rhythmic combinations previously unavailable to composers, Prof. Arel says. "To a piano player, 12 successive notes a second is the maximum that can be produced, but", he adds, "with electronic music techniques we are limited only by the ear's ability to perceive."

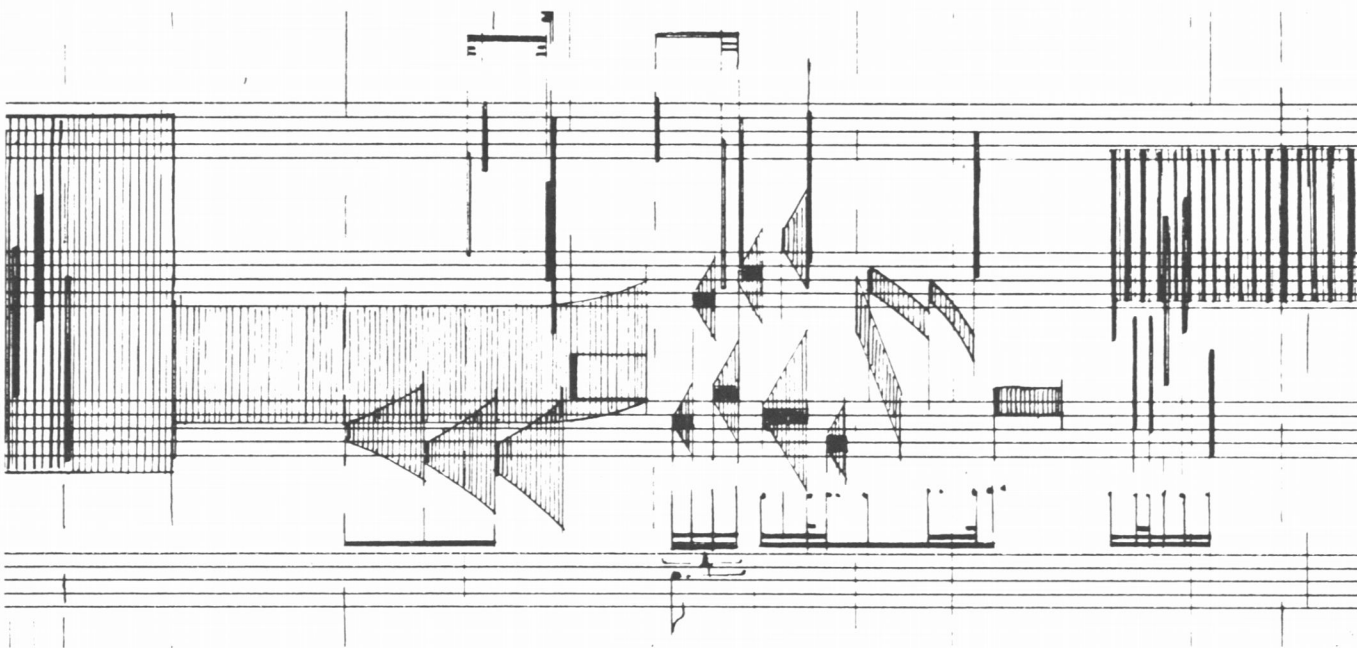
"By completely controlling rhythmic complexities, an incredible amount of timbre or spectrum is possible, along with a limitless dynamic range which can be increased to the threshold of pain, if wanted," he adds.

Once he has produced the raw sounds he desires, Prof. Arel employs a collage technique to compose the music. Each layer, or sequence of sounds, is recorded individually. Writing one level at a time, Prof. Arel will construct a piece that may consist of as many as 24 layers.

One advantage that electronic music holds over more conventional forms is the degree of control retained by the composer. Composition is finished in the studio, "so there can be no problem with interpretation, rehearsals, performers or a conductor," Prof. Arel says.

He believes that public acceptance of the new form is growing, but sees this "new frontier in music" as "slightly confusing." "Composers must have a strong foundation in musical theory and be trained in the classical disciplinary form," Prof. Arel asserts, adding "the field of electronic music is filled with amateurs, and neither the public nor the critics are very knowledgeable about it. The field is mushrooming as the music becomes more popular. It is now being used more and more in both folk and rock, for example."

His electronic works include *Short Study*, stage music for "The Scapegoat" (a play by John F. Matthews based on Kafka's *The Trial*), *Electronic Music No. 1, Impressions of Wall Street, Music for a Sacred Service (Prelude and Postlude), Stereo Electronic Music 1 and 2, Music for String Quartet and Tape, Mimiana 1 and 2, Capriccio for T.V.*, the sound track for the film "Out Into" by Irving Kreisberg in collaboration with Daria Semegen, and *Mimiana 3* or "6 and 7." ▼



Students Volunteer Time, Talents To Pt. Jeff Hospital

A group of students from the State University of New York at Stony Brook is showing their community that they really care by working as volunteers in St. Charles Hospital in Port Jefferson.

The students, all members of the University's Health Professions Society, are spending an average of four to five hours a week at St. Charles. Preparing for careers in the health field, these young men and women are working on the hospital's surgical and medical floors, in the emergency room, in rehabilitation, pediatrics, X-ray, physical therapy, maternity, and in the ambulatory clinic.

Every day, student volunteers from Stony Brook can be seen assisting the hospital's medical staff. They transport patients, prepare medical charts, help distribute mail and assist with meal service, read to patients, and perform dozens of other supplemental tasks to help ensure thorough patient care. Since January of this year, when the Stony Brook volunteers first started coming to the hospital, they have logged almost 1000 hours at St. Charles.

Response to the volunteers' efforts has been extremely positive. Mrs. Vincent Wick, head of volunteer services at St. Charles, has called the students "dedicated and adult, appreciative of the valuable experience they are receiving. . . . They are an asset to our volunteer service."

The Stony Brook volunteers have probably acquired their greatest reputation in the emergency room, where they are involved in total patient care, from preparing charts to helping with X-rays and assisting in any way possible in an extreme "under pressure" atmosphere. "They act maturely, responsibly, and independently, like regular members of the emergency room staff," comments Rosalind Dean, R.N., former head nurse of the emergency room. The present head nurse, Mrs. Linda Lewis, R.N., says the volunteers are "very helpful and genuinely interested in what they're doing — they ask many questions. They are here for a learning experience and we are doing everything we can to expose them to this experience."

In X-ray, the students are also compiling a successful record. "These students fit very well into our program," says Francis Blanch, supervisor of St. Charles' X-ray department. "They're bright and they learn very fast. I only wish we could get more of them."

The entire Stony Brook student volunteer program at St. Charles was the idea of Steven Selter of Port Jefferson, a biology major who is in his junior year at Stony Brook. Before he started

the program, he had worked in local hospitals both as an employee and as a volunteer during his high school years.

According to Stevé, "the idea came to me because I saw too many pre-med students concentrating only on books and classroom work — most of them had never worked in a hospital before, and I really believed that this kind of experience could be invaluable to them to help them see if they were really choosing the right career for themselves."

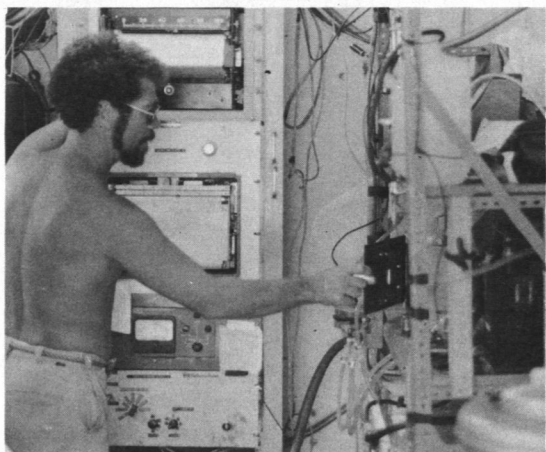
As president of Stony Brook's Health Professions Society and as a part-time emergency room orderly at St. Charles, Steve was able to coordinate arrangements with the hospital quickly and efficiently. Within two months, 25 volunteers — all members of the Society — were spending about four hours a week at St. Charles.

Now in his second year as president of the Society and still an orderly at St. Charles, Steve feels he's taken the realistic approach to preparing himself for a medical career. "The time I've spent in hospital work has been of great benefit to me. I wanted to know long before I reached med school just what medicine could or could not offer me and if I was really "cut out" for that kind of a career. If I'm to spend so many years studying and preparing for a profession that's going to last the rest of my life, then I must be sure I'm making the right choice. Hospital work has given me the insight into the future I needed — but I had to go outside the classroom to prove to myself that medicine is for me."

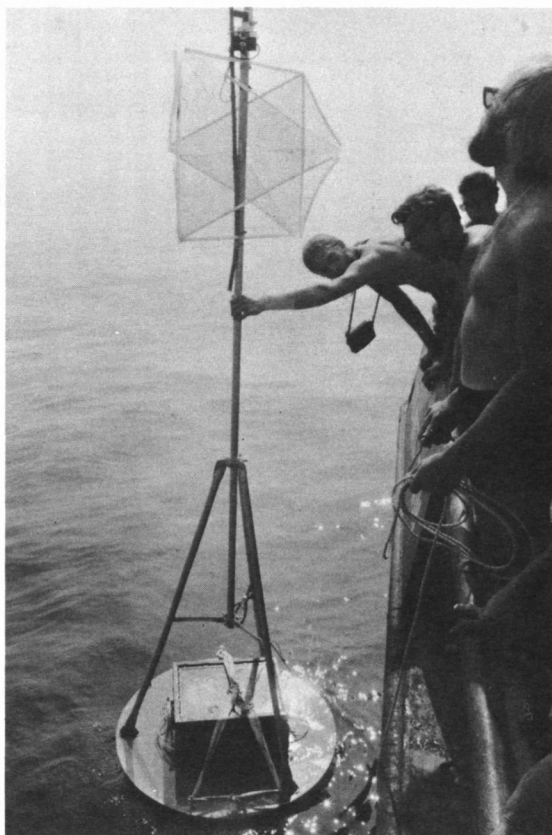
Dr. James A. Fowler, former health professions advisor and associate dean of the University's Division of Biological Sciences, encourages the sound philosophy behind the volunteer program. "Our students have gained as much or more from the experience at St. Charles than from any course. Young people need a chance for action in order to learn about themselves."

The number of Health Professions Society students volunteering for service at St. Charles is growing, as is the number of hours they are each giving to the hospital. "This," Dr. Fowler points out, "is a valuable service to the community — these kids are giving everyone a fine impression of our University through the commendable work they are doing. It's a real and positive example of campus and community working together."

Steve Selter probably sums up the program's success: "People at the hospital are always thanking us, and we're always thanking them." ▼



Marine researchers from Stony Brook (right) lower one of two "drougues" overboard to measure the direction and strength of ocean currents and (above) regulate shipboard equipment which keeps tabs on the drougues and records information from them.



Marine Researchers Sail the Ocean Blue - And Black

Ambrosial is not an appropriate description of the Ambrose Lightship region of New York Harbor.

This has become obvious to the 14 marine researchers — faculty, staff and students — from Stony Brook's Marine Sciences Research Center who have been studying the area, which is the sewage sludge dumping ground for metropolitan New York.

The men claim the waters are the filthiest and smelliest they've ever seen. "Barges loaded with black solid sludge from secondary treatment plants are pulled by tugs, maybe 100 yards ahead," explains Dr. Malcolm Bowman, assistant professor of physical oceanography. "From the tugs, a switch is activated and the barges release their load into the sea about 10-15 miles from New York City."

What happens next is what the scientists are trying to learn. Does the filth drift back toward the city, sink to the bottom or disperse itself over a wide area? Studies of the current and tides may hold the answer.

During a ten-day, 800-mile scientific cruise last summer the men not only saw some of the

blackest water around, but also some of the cleanest. About 120 miles from Manhattan they found that the Gulf Stream, which they described as "very blue, clear and 4-5° warmer than the surrounding water," had taken a rare turn, meandering onto the Continental Shelf, more than 100 miles closer to the city than usual. "But a week later the Stream had returned to its normal route," said Dr. Iver Duedall, assistant professor of chemical oceanography.

During another part of the voyage, the scientists studied currents in the far western sections of Long Island Sound. According to Dr. Bowman, 800 million gallons of sewage a day enters the waters of the East River and the latest data suggest that up to 50% of this migrates east into the Sound, polluting water even farther east than Stony Brook.

The men have spent months analyzing the data they accumulated last summer. And they will continue to collect and analyze information in their quest to reconcile man's need to dispose of wastes with his desire for clean water. ▼

Stony Brook Review
Office of University Relations
State University of New York at Stony Brook
Stony Brook, New York 11790

Vol. 6, No. 5 December 1973
The Stony Brook Review is produced by the Office of University Relations. Ralph Chamberlin, editor. Published in February, April, June, October and December at the State University of New York at Stony Brook, Stony Brook, N.Y. 11790. Second class postage paid at Stony Brook, N.Y.



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