



During a preview of Open House '75, Dr. Vineyard, Dr. Seamans and Dr. Tape lead a delegation of county and state officials on a tour of selected Lab facilities.

## Lab Welcomes Visiting VIP's

Dr. Robert Seamans, Administrator of the Energy Research and Development Administration was joined by state and county officials for a preview of Open House '75 on Friday, May 16.

Following a buffet luncheon, the VIP's gathered in Berkner Hall to speak before members of the Scientific Staff before going on a tour of selected Open House exhibits.

Besides Dr. Seamans, other dignitaries attending the preview were: AUI President Gerald Tape, Congressman Tom Downey (2nd-N.Y.), Congressman Norman Lent (4th-N.Y.), State Assemblyman Paul Harenberg (5th A.D.), State Assemblyman William Bianchi (3rd A.D.), County Legislator Floyd Linton (4th L.D.) and Brookhaven Town Councilman Robert Reid.

In Berkner Hall Dr. Vineyard welcomed the guests to the Laboratory and introduced them to the staff, assembled for the occasion. After a few introductory remarks, he offered the microphone to several of the officials. Tom Downey began by saying he had never realized how long the country had been engaged in the peaceful uses of atomic energy since the Lab was formed three years before his birth.

Downey continued, "I might say that in terms of giving birth this lab has given birth to many exciting new technological developments in our country. It is also exciting to be a part of, or near this laboratory in terms of what it has done and the pride it brings to Long Islanders. It is also nice to know that it is labs like this and programs you will be working on that will not come under a Federal cutback in terms of expenditures because energy, as we are all well aware, is something that we have to develop in terms of alternatives. We can do that here, and I think you will find the Congress of the United States in the years to come, especially this year when we are determining our budget, to be a little more liberal in terms of providing money to develop energy alternatives."

Norman Lent then took the microphone and said, "I am delighted to be able to participate in this Open House at Brookhaven National Laboratory, which is renowned throughout the United States and indeed the world, as one of the foremost facilities



Dr. Robert Seamans

for scientific research and development. I look forward to the balance of the day, or at least so much of it as I can spare, joining with you in visiting the many departments and exhibits and in learning more about the tremendous strides that are taking place here at Brookhaven to solve some of our problems in the fields of energy and medicine and the environment."

Dr. Vineyard then read some messages sent by those who could not attend the ceremonies. "Very sorry I could not be with you. Best wishes for a successful Open House," said Congressman Otis Pike, (1st-N.Y.). Congressman John Wylder, (5th-N.Y.) said, "Regret my inability to join you today at the Open House of Brookhaven National Laboratory for what I am sure will be a pleasant afternoon."

Congressman Jerome Ambro (3rd-N.Y.) sent his regards and said, "Brookhaven has (Continued on page 2)

## A Message From The Director

By all standards Open House '75 was a huge success. Our throngs of visitors were pleased and intrigued with the examples of Laboratory people and projects on view. The sense of openness, the courtesy and enthusiasm of our staff, and the great care that had obviously gone into planning were widely and visibly appreciated.

The credit belongs to all of the hundreds who were involved, and it is impossible for me to give adequate thanks to each of you individually. Bob Anderson and his hard working Steering Committee, who conceived this mode of demonstrating the Laboratory, worked it out, and engineered its execution, deserve particular gratitude. Everyone who served as a guide, a lecturer, an answer person, or a marshall deserves commendation. The real spirit of Brookhaven was on display last week. It was our Laboratory and we were proud of it.

—George Vineyard



## Open House '75 Steering Committee

Chairman: R.C. Anderson.

Traffic and Safety: R. Young, L.F. Phillips.

Literature: R. Peierls, Y.Y. Chu, K. Boehm, J. Burke, R. Brown.

Visuals: R.A. Meck, H. Wegner, L. Suydam.

Information: A. Paskin, D. Metz, J. Olson, G. Latham, W. Walker, J. Spiro.

Public Relations: C. Thien, V. Sayre, M. Kuper.

Services: R. Fuchs, R. Lehn, E. Hunter, Mrs. G. Dimmler, G.A. Price.

## BNL Lecture Explores NE Energy Future

The next Brookhaven Lecture will be "The Energy Future of the Northeast; The Role of the Technical Community," presented by Philip Palmedo, DAS, on Wednesday, May 28, at 8 p.m. in Berkner Hall.

The 128th Brookhaven Lecture will begin with a brief discussion of the current energy situation in the Northeast. Palmedo will then describe some of the elements of the Regional Energy Studies Program at Brookhaven and how they relate to energy problems of the region. The program will be looked at as a means for bringing the talents of the technical community and technical programs to bear on problems of social concern.

The program is a new approach to the analysis of energy technologies and impacts. It is also a new role for Brookhaven and the technical community in energy planning. The program is unique for Brookhaven in the number of disciplines and technical areas encompassed, and in the relationship to regional, state and local users.

Some of the subjects the program is dealing with are: energy facility siting, with consideration being given to nuclear power parks and offshore siting of nuclear reactors as well as multipurpose artificial islands; urban energy supply problems, with initial emphasis on pollutant transport methods that can be used for technology assessment of urban systems; problems associated with the increased use of coal in the Northeast, with emphasis on pollutant transport and health impacts; energy conservation strate-

gies, with initial emphasis on major conservation opportunities on a regional and state scale.

To form an informational basis and a framework for these individual studies, an extensive regional data base is being assembled and a set of regional energy-economic-environmental models are being constructed. The program involves a number of groups at BNL, primarily in the Department of Applied Science, and is drawing on groups at Princeton, MIT, Cornell, Carnegie Mellon and Stony Brook.

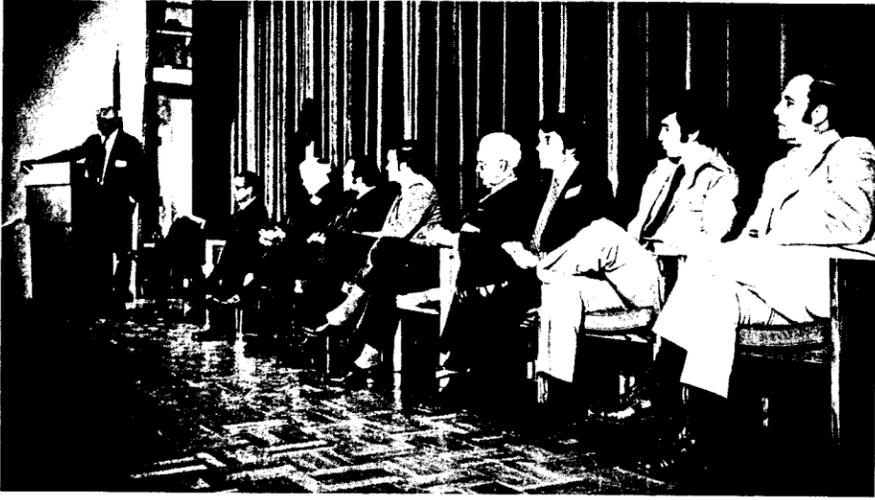
Palmedo came to BNL as a physicist in 1964. He now heads the Energy Policy Analysis Group in the Department of Applied Science. Previous to 1970, he conducted research on nuclear reactor physics. He then worked briefly on problems of the control of nuclear weapons materials. Since 1971, he has been engaged in energy systems analysis, establishing a broad set of energy systems analysis and policy studies at Brookhaven. With Kenneth Hoffman, DAS, Palmedo developed the framework and modeling approach and performed the systems analysis for the OST/FCST assessment of new energy technologies. The techniques developed in that assessment are now widely used for energy planning and policy making.

He is currently directing research and policy studies at Brookhaven relative to regional energy planning and the health and environmental costs of alternative en- (Continued on page 2)

## Laboratory Opens Doors To 13,000



**VIP's Preview Open House**



Dr. Seamans at the podium in Berkner Hall. Also on the stage are (left to right): Dr. Vineyard, Dr. Tape, Norman Lent, Paul Harenberg, Robert Reid, Floyd Linton, Tom Downey and William Bianchi.



Dr. Harold Atkins (left) speaks with Assemblyman William Bianchi (right) and Mrs. Bianchi.



During a tour of selected Open House exhibits, Eric Forsyth explains superconducting power transmission to the visiting dignitaries.

**BNL Lecture**

(Continued)

ergy systems. He has directed short term interdisciplinary studies of the external social costs of energy and the environmental research implications of current energy policies.

Palmedo has served on advisory committees to the Department of the Interior, the Federal Power Commission, the Organization for Economic Cooperation and Development, and most recently the Office of Energy R&D Policy of the Federal Energy Administration.

He is an Adjunct Professor in the Urban and Policy Sciences Program at the State University of New York at Stony Brook, and has also been a visiting professor at Williams College. He is one of the founders and an associate editor of the journal, *Energy Systems and Policy*.

Palmedo did his undergraduate work in physics at Williams College and received his M.S. and Ph.D. degrees in Nuclear Engineering from the Massachusetts Institute of Technology.

A buffet supper will be served at the Brookhaven Center before the lecture beginning at 6 p.m. Reservations should be made in advance by calling Ext. 3541 before 5 p.m. Refreshments will be available in the lobby of Berkner Hall immediately after the lecture.



Philip Palmedo

**VIP Visit**

(Continued)

been a leader in the scientific field, and I am gratified with the Lab's response to my call for a major effort in creating an energy research center on Long Island that will be unsurpassed in the nation. Thanks for your continuing interest in this project. Together we can solve the pressing need for alternative sources of energy.

A letter from Suffolk County Executive John V.N. Klein addressed to Dr. Vineyard read, "I regret that I cannot attend the Open House at Brookhaven National Laboratory today. As you know, I consider the work at Brookhaven of vital importance both to the furtherance of pure science as well as to coping with the many technological problems confronting Suffolk County and the Nation today. We in Suffolk County are proud to have such a prestigious institution here, and as they have done for the past 28 years, I hope scientists at Brookhaven will continue extending the boundaries of man's understanding of the universe.

AUI President Gerald Tape introduced Dr. Seamans and at the same time said a few words about Open House. "Visitor's Days to me have been represented by sort of a twofold approach - one, an obligation on the part of the Laboratory and the staff to demonstrate to the public that indeed there is important work going on here, and that it is work of a nature that the public should not only be interested in but also should be proud to support. At the same time I think on the part of the staff there is a feeling of importance in the sense of an opportunity to display two others - the work which is going on and a feeling of pride and accomplishment of work well done."

Following is the text of Dr. Seaman's speech, delivered during the ceremonies for the preview of Open House '75:

*The following is the text of the speech delivered by ERDA Administrator Robert Seamans during his visit to the Laboratory on Friday, May 16, for a preview of Open House '75:*

I'm delighted to finally wend my way in a somewhat northeasterly direction out of Washington and have the chance to be here with you and learn about the various things that you're doing. I'm more or less familiar with one of the areas in which you are engaged, but of course I'm not familiar in any depth with the importance and significance of all your activities. I believe the only way that one can even get a glimmer of what's going on in a laboratory is to go to the lab and use one's eyes and look around and, much more importantly, exchange views with the people who are there.

I'm sure that in your minds you're wondering what ERDA is all about, what kind of changes may result from the legislation that occurred last fall; I can assure you that in my own mind I'm still wondering exactly what our ERDA responsibilities will be.

I might, first of all, tell you just a couple of things about ERDA that I've thought about quite a bit myself, sort of an overall nature; then get into a few specifics.

It must always be borne in mind that ERDA's mission is very different from NASA's mission, although there are similarities. In the case of ERDA, we'll be putting together a variety of pilot plants and demonstration plants, and of course we'll be working with universities and with industry.

But in this process of research and development, we have to recognize that we're not the only ones involved, that there are other government agencies that are doing some of the work in energy research and development. We estimate that we'll be doing about 85%, but the other 15% is important. The Department of Interior is retaining the work in mining technology; the Environmental Protection Agency is retaining work on control technology for emissions, from stack emissions, for example. Even more fundamental than that, industry has a very, strong R&D program in some fields (very weak in others I might say), but the big difference comes when we look beyond the research and development.

How are we going to implement our various technologies in new types of delivery systems of energy, how are we going to put into effect new means for using our energy efficiently? And, clearly, this is not the responsibility of ERDA and it's only indirectly the responsibility of government. Obviously government must provide the overall environment, the overall framework so that industry can work effectively. But the delivery systems are in the private sector, and the consumer is each one of us. We're all interested in the results of the research, the development, the delivery system, and what it means to us at home when we fear that the gas may be turned off at some future time as it was winter before last, when we had trouble getting gasoline for our automobiles, or what it means to us today when the cost of energy is tending to skyrocket. So there are some very major differences between the ERDA responsibility and, I believe, any other governmental organization that's ever been put together.

Now to look at a few specific areas, particularly areas that I think you yourselves may have given quite a bit of thought to. Let me first mention John Team's area (a person, I am sure quite well known to you), which now includes not only the physical research program but also other areas like solar and geothermal energy systems. In physical research we note that if you look carefully with sort of an OMB kind of eye at things, perhaps you could justify 50% of the work as clearly directly relevant to an energy activity like ours. But how about the other 50%? How about the 50% that's involved in high energy physics, that's involved in certain other areas of a very fundamental nature? How do we at ERDA view this kind of effort? I wanted you all to know how we do view it. First of all we view it as extremely important. We view it as a program which we believe should be maintained in ERDA. We believe it is a program that has importance in its own right. We believe it's the singularly important intellectual stimulant to mankind, and we believe it is important, as I say, in its own right. We also believe that the really basic work in time, we don't know exactly where, will have relevance, not only to en-

ergy but in many many different fields of endeavor. So, we feel, yes, it is important to ERDA that we retain it.

We are really trustees of a very great capability that this country has here and in other national laboratories. It is up to us to see that it flourishes, it is up to us to see that it is properly, and continues to be properly, tied in with our university structures and with physics departments around the country. I can assure you that this will be one of our endeavors to see that this effort is not just maintained but, if anything, is given new forward thrust in appropriate directions as determined by those who are involved in the program.

In another area, namely biological research, we have somewhat the same situation. We know that the work we're doing is important. We must understand biological effects of various sorts if we're going to carry out our environmental and safety responsibilities properly. In the past, this has been related primarily to nuclear energy. Now this must be broadened, we must consider the biological effects of coal and other fossil fuels as well as all of the energy areas in which we are working. We also know that what we're doing here has a direct bearing on medical research that does not directly relate to our energy programs. And, again, we have a trusteeship here, we have a responsibility here to see that wherever this research and this capability can be utilized that it is utilized. Again we must see that we have a continuing strong program.

Now, I myself, have not had an opportunity to work directly with you in the two areas I've mentioned, but there is one area I'd like to mention where I'm benefiting daily from the activity here. I do want to mention it because I'm most appreciative of your efforts, and that is in the field of econometric studies. We have a responsibility written into our legislation to present to the Congress on June 30 the results of a planning effort that has been going on since we opened the door on the 19th of January. This planning effort is supposed to point out areas of research that we think are deficient and areas where we think, for that reason, more funding is required.

This planning effort came to my attention even before I had my confirmation hearings, and I received a call from a number of senators and congressmen who wanted to get my views on the matter, and I was trying to be very circumspect in those days and say well it's not my watch, I'm not responsible, but they finally said they thought it was important to get my views. At that time the plan was to put together in three phases. The first phase would involve the period from now until 1985. The question is what could we do of an R&D nature that might have some payoff in the first ten years of ERDA's existence. The next phase was the period 1985-2000 and, in the long term, 2000 and beyond. And we were to have in the then proposed legislation six months for the first study, twelve months for the second, and eighteen months for the third part of that study. Well, I guess I made a mistake but I said I really don't think you can put together a plan that way. I believe that what we do has to be thought of as a continuum. Obviously, we will be picking up, we'll be learning as we go along and making changes, but in thinking today about our total program, we ought to think of it as a total program and think of it in terms of all the many symbiotic relationships that exist. And, as a result of that, I said why don't you have it all in the same time-scale and phase it in with the '77 budget. In other words, give us a year's time to carry out this study; then when we submit it, it'll be in connection with next year's budget. They thought the idea of putting it all together was a great idea, but they thought that instead of having it relate to the '77 budget, it ought to relate to the '76 budget, and, as a consequence, we have this June 30 date staring us in the face.

The way we've organized to do this is to have both a planning and a budget committee. Bob Fri, the Deputy Administrator, is the chairman, and on the committee are the six assistant administrators. Then, depending on whether it is planning or budget, the person in the hot seat is Roger LeGassie or Merwyn Greer our controller. It is up to them to put up the straw man and advance ideas, and these are reviewed by all the participants. We went through this exercise last week. I went out to Germantown and spent a week over our plans,

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## Seamans

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and one of the elements that's particularly helpful in thinking about the totality of our effort is the results of studies of national energy systems that you have carried out here. Various assumptions may be made and then we take a look at your results. One of the assumptions tried was to do everything that is reasonable to conserve energy without making any great effort to increase our energy resources, also of course, various conditions on transportation use, residential use, heating and cooling, efficiency of industry, etc. were put in. And that gave us one set of results. Then we took a look at another set of conditions.

Let's suppose that instead of really putting all our emphasis on conservation, we do everything we can to electrify our economy. Then we get another set of results, and we took a look at logical, I believe, alternatives that any of you would think of if you were carrying out such a study. We found a result which I guess should have been obvious, but it's good to have it reasonably quantified. That is that there's really no one simple thing we can do in this country that will permit us to continue more or less with our same life-style, more or less with our same economy, taking into account the fact that the country is growing in size. Even though our birth rate is down, we're still going to grow by another forty or, I guess, fifty million people. Taking into account that we do have disadvantaged people in this country who are looking for more opportunity as time goes on, and putting in these kind of conditions, you find that no matter which of the alternatives are selected, the imports of oil from abroad will increase with time. We weren't satisfied, of course, with any of those results, although it gave us some insights as to what the most important factors are, so we then started putting in not just one approach but a variety of approaches. We found that, even doing all the things that appear to be logical, it is going to be very hard to achieve zero imports by the year 1985.

Actually, if you look at President Ford's energy message you see that he really was not calling for zero imports in '85. He was hoping to get the imports down to 4-5 million barrels a day equivalent by that date. And, to do even that will be very very difficult. So we're faced with a long term problem in this country with regard to energy, and we've got to recognize that we have to work in many different fields if we're going to achieve our overall goals.

If we move further into our study, we're tempted to single out those areas that are most important in each one of the time periods: now to '85, '85 to 2000, and 2000 and beyond. And to oversimplify, I'd like to give you some insights as to what came out of that. Between now and '85, the principal thing we can do is to make maximum use of our domestic supplies of oil and natural gas. This means getting into such things as secondary and tertiary recovery from our existing fields, and here's an area where quite a bit of work has been done already. It's an area where ERDA can participate. It's an area where it's not entirely, technological and scientific.

We also should start to work in certain areas that I think of primarily as conservation, I include in conservation, moving out on a solar program for housing, heating and cooling of buildings. We are about to go out on a set of bids that in time could lead to about two thousand solar heated residential houses. We're doing this with HUD. By going to that number it will permit us to test out not only a variety of technologies but also a variety of climates. And, in turn, assuming success, and I believe it will be successful, providing a variety of suppliers an opportunity to develop commercial equipment so that maybe five years from now, five to ten years from now, if any of us wants the benefit of a solar house he will be able to, in effect, use catalogs, or work through an architect friend or on his own and determine how much it will cost to install the equipment. We can also know if we live in a given area, what we can expect to save in the way of gas or fuel oil or electricity.

In moving to the period, say '85-2000, we certainly must continue the conservation effort. It shouldn't be limited to housing, and obviously ought to be in the area of transportation, particularly the automobile which is a great user of energy as you all know. Twenty-five percent of our energy goes into transportation, and of that, seventy-five percent goes into the car, the

bus, and the truck. So we must be working in that area. But on the supply side, we've got to do everything we can to bring along coal and nuclear energy. I want to mention the nuclear here, particularly, because I think it is an area where I believe this Laboratory, along with others, can be of assistance. First, I want to make it clear that I am not talking about the breeder, I am talking about the present type reactor systems - light water reactors principally. It appears to me, that we can achieve maybe as many as several hundred nuclear power plants by 1985. We have about 50-60 in operation now, we have another comparable number under construction, and a comparable number in the planning stage. But it is coming awfully slow and they are not working as well as they should. The safety record is good and we must maintain our safety record. But there is just too much down time and it takes too long to license these plants. We've conducted a very careful study of this from the standpoint of what ERDA can do.

What we can do first of all is to serve as a repository of information as to what kinds of shutdowns are occurring. When there is downtime, why is it? Is it an operator problem, and why should the operators cause problems? And they do at times. Is it a pipe that's cracked and, if so, for what reason? Is it a valve that has given way and why? On the basis of sort of a comprehensive day to day stocktaking we can then point up the research and development that needs to be carried out. Some of this is already being done but more needs to be done.

Now on the other side, this whole matter of licensing is a very difficult area. I'm very much in sympathy with Bill Anders and the Nuclear Regulatory Commission and their almost impossible assignment. It is made more difficult at times because of insufficient data. We have a responsibility to review the kinds of questions and issues that are coming up, and then to see what kind of research needs to be carried out so that, when those issues come up in the future, there will be data available that can be utilized. We're going through that process right now to see what those areas are that need further investigation.

Now, just a word in closing about the period beyond 2000. I always like to emphasize there's not too much in really worrying about 2000 and beyond unless we know how we're going to get through the next 25 years. But for 2000 and beyond, if we use the time wisely, we have the chance to look into at least three very exciting possibilities. One is the solar and I'm talking about in the large sense of converting solar energy into electricity. We are planning to go ahead fairly soon with some kind of a thermal test center with mirrors and a boiler up on the tower, that kind of thing, to see how we might come out with that approach. One way is a direct conversion using something like the solar cell that we used in space, but obviously on an expanded basis, with cost down by a factor of maybe three orders of magnitude to make it economically viable. We must be pushing ahead in the solar area.

We also are working, as I've already said, in the area of fusion. There are a lot of possibilities that we're working on, any one of which might pay off, but at this time we can't be sure that any will pay off. We just don't know at this time whether it is scientifically possible, technically possible, much less economical to go that route.

Finally, we've got to work on the breeder, and here we already have quite a bit of work underway I think we should move out on the development. I think we ought to get the facts, both from the standpoint of the benefits as well as the cost and the risks. The breeder offers tremendous potential in the use of our uranium resources, factors of maybe fifty to one over the present reactor systems. So we must go down all three of those routes and we must carry out all three aggressively at this time.

Needless to say when you think of all that needs to be done, it is going to be a tremendous challenge for all of the national laboratories. It is going to be our objective to find the right mix, if you will, of work for each laboratory that ties in with the heritage of the particular lab, the interest of the individuals in the lab, and our overall needs. That will require working with all of you. I hope that you'll all feel that you're proud of the past, but that as we get into the new ERDA responsibilities that you are truly glad that the legislation was passed last fall which brought ERDA into being. Thanks very much.

## Images Suspended In Space &amp; Time

Is there really a third dimension? Peter Nicholson, a sculptor with Cooper-Hewitt Museum of Design in New York, believes that many people are so used to viewing things two-dimensionally that they might not be aware of a third dimension.

Nicholson is also a holographer and holography, he explains, is the only true means available for reconstructing a three-dimensional image. On Wednesday, May 28, at 3:30 p.m. he will present a Lab-wide seminar in Berkner Hall entitled "Holography, the World of Illusion."

A hologram is a three-dimensional image stored on a high-resolution photographic

## Why Is The Sky Blue?

How many earthworms are there in an acre? Why is the sky blue? Can you tell me all about quantum theory? These are a few samples of the questions asked of scientists by people visiting the Laboratory last weekend for Open House '75.

Over 13,000 people from as near as Yaphank and as far away as Italy wandered freely around site seeing exhibits, asking questions and watching demonstrations about research at BNL. After seeing the Tandem Van de Graaff, a sprite grandmother of four decided that Brookhaven Lab was the second most impressive thing she had seen in her life, the first being the nose cone built for one of the moon shots. But after pondering awhile she decided that Brookhaven might be the most impressive after all.

The visitors included scientists, science teachers, Lab employees who had never seen some of the facilities, curious children and grownups, students of all ages, and a honeymoon couple from Italy. Many came both days because they had no idea how large the Lab was and how many things were going on here. Those who came only on Sunday regretted that they had not been here Saturday too. Most of the visitors agreed that they would definitely come again if the Lab were to have another Open House.

A random sampling of comments made by visitors include: "It's fantastic," "I work here but I don't see many of these things during the day so it is amazing to me, too," "I have never been to anything like this before and I had no idea it would be so large," "It's fascinating, absolutely fascinating," "We just arrived but were fascinated just walking in here," "We like the explanations and seeing the big things in action," and "The people at the exhibits really know what they are saying and can get it down to the level for most lay people."

When one boy was asked what the most impressive thing was he had seen, he paused, giggled and hesitantly said "the sliding doors at the entrance to the medical building, because they remind me of something I read about." But then he went on to say that he couldn't think of anything else specific that he liked because he liked everything.

One scholarly looking 12-year-old walked up to the Science Hot Line and demanded to know everything about quantum theory, at which a physicist at the table proceeded to tell him what he wanted to know.

What happens when a young child volunteers his father for research? That was the case when one scientist was explaining why animals instead of people are used in experiments. Looking at two little boys standing in front of him, the scientist jokingly said, "Of course we could use little boys but we would prefer not to," at which point one of the youngsters perked up and said "You can use my father."

One 10-year old pounded his fist on the information counter in Berkner Hall and emphatically demanded to see a reactor, claiming that he had come all the way from upstate New York for this purpose. When he was told that he could see one, his eyes popped from his head and gleamed. Apparently someone must have told him that he couldn't see one.

As everyone knows, "kids say the darndest things," but so do some adults. One man who was very enthused about Open House, innocently asked "Do you do this every weekend?" That question could easily bring sweat to the brow of anyone who worked to make Open House '75 possible which was really the whole Lab.

plate, exposed with a laser. The image is produced by the interference patterns of two laser beams, one focused on the object and the other on the plate. When the film is developed and illuminated with another laser the image appears to pop out of the plate and is recreated in space. Suspended in space, the image has all the qualities of the original but if a person were to try to touch it the hand would pass right through it.

Holography was theorized in 1948 by Dennis Gabor, an English scientist. He managed to test his theory using a mercury arc lamp but, to test it effectively, he needed a source of coherent light - light whose waves travel in a single plane. The development of the laser in 1960 provided him with a source. The first laser holograms were made in 1962 by a group at the University of Michigan. In 1971, Gabor won the Nobel Prize for Physics for his theory of holography. The technique is called holography after the Greek for whole (holos) and message (graphos).

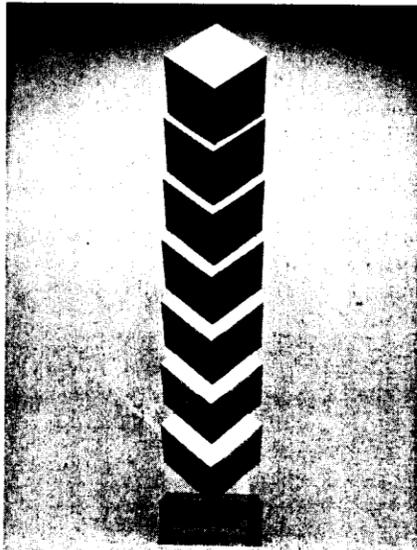
During the first decade following the development of the laser holograph, there was a burst of interest in this new technique and hundreds of laboratories around the world began investigating holography. It has been used as an art form on a very small scale primarily because the equipment needed is relatively expensive.

In an attempt to marry the scientist and the artist, Nicholson has established a holographic arts program at the Cooper-Hewitt Museum and is preparing to set up a laboratory in the basement of Brookhaven's Chemistry Building. A quarter of a million dollars worth of equipment has been donated to the Smithsonian Institution, which operates the museum, by the McDonnell Douglas Electronics Company, one of the two largest companies involved in holography. The equipment will be set up at Brookhaven and it is Nicholson's hope that both artists and scientists can work together to investigate holography.

"I have always been more of a Renaissance thinker and have never agreed that there has been a bifurcation between the artist and scientist. The creative process is the same whether you are an artist or a scientist," said Nicholson. "Some of the best holograms are going to be joint works between artists and scientists."

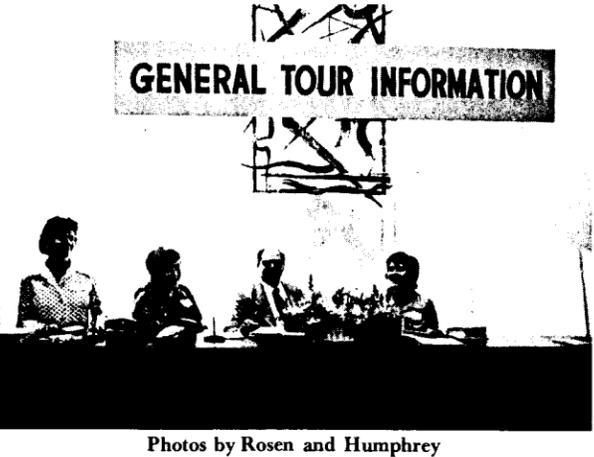
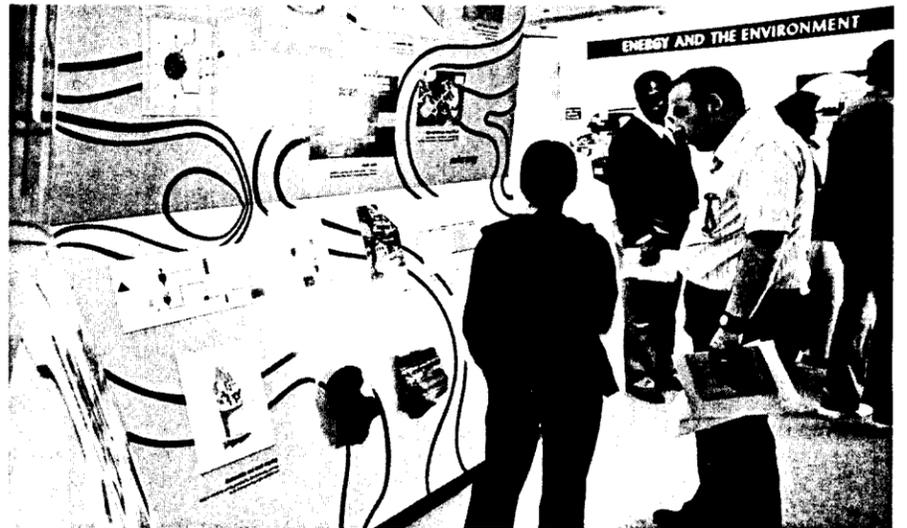
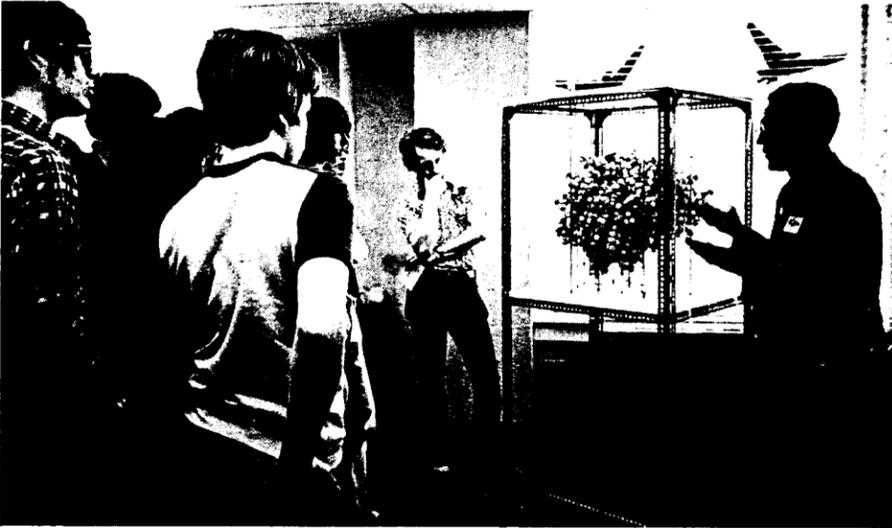
Nicholson compares the development of holography to the development of perspective in the Renaissance. Perspective was a new way of looking at the world, as is holography. "We are entering into three-dimensional communication which is a large step for culture," said Nicholson.

Nicholson, originally from England, came to the United States in 1954 and is currently living near Easthampton. He describes himself as a designer/sculptor/holographer. As a sculptor, his interests range from the design of spherical solar habitats to "Galaxos," a contemplative environment. He has executed many architectural commissions including a 20-foot diameter altar piece for St. Stephen's Episcopal Church in Washington, D.C. He is presently working on a polished, stainless-steel column which will rise out of the artificial reflecting pool at Fermi National Accelerator Laboratory.



The study model for a 60-foot column, designed by Peter Nicholson, to be erected at FermiLab. The design for the stainless-steel structure was based on a hologram.

# Open House '75: A Big Success



## Day-Long Celebration At BERA Film Service

On Friday, May 30, between 8 a.m. and 5:30 p.m., Lemarant Arts, Ltd. will officially celebrate its grand opening as operator of the BERA Film Service by offering film at their cost to all employees. A sample of savings on film that day excluding tax: C 126.12 will be \$1.05 per roll; C 126.20, \$1.30; K 135.20, \$1.45 and K 135.36, \$2.10. At these prices the number of rolls that can be purchased by an individual employee may be limited by Lemarant.

Andre LeGendre, co-owner of Lemarant Arts and Real Colour Labs, will be on hand to meet his new customers and determine just what kinds of merchandise and services BERA members would like to have available.

Susie Ayala, who has been with the Film Service for five years, will be on maternity leave through the summer. During her absence, LeGendre's daughter, Thea, will "tend the store."

## Train Riders Take Note

Changes in the Long Island Railroad timetable, effective May 19, will alter the Lab's bus schedule.

The a.m. bus will wait at the Patchogue Station for the train scheduled to arrive at 10:06 a.m. This train leaves Penn Station in NYC at 8:37 a.m. and Jamaica Station at 8:56 a.m.

The p.m. bus will leave the Administration Building at 3:45 p.m. for the Yaphank Station to meet the 3:59 p.m. train. Prompt departure is necessary to meet the train, and riders should arrive at the Administration Building no later than 3:40 p.m. This train arrives at Jamaica at 5:47 p.m. and at Penn Station at 6:11 p.m. Please make reservations for the p.m. bus by calling Ext. 2345.

## Cyclists Will Pedal

The 17½-mile bike-a-thon, which was cancelled because of rain, has been rescheduled for Sunday, June 1, at 10 a.m.

Participants can register in advance by contacting Bob Powell, Ext. 4061, or Gerry Morgan, Ext. 4841. Children under 18 must have their registration forms signed by their parents. Registration on the day of the race will begin at 9 a.m.

A rain date has been set for Sunday, June 8, but let's hope for the best.

## Cooking Exchange

An annual favorite - Men Cooking - returns to the Cooking Exchange on Wednesday, May 28, at 12:30 p.m. in the Recreation Building.

This is the last meeting until September, and we really encourage you to attend this very special program.

The International Dinner is June 10th. Keep the date open!

## Cafeteria Menu

### Week Ending May 30, 1975

<b>Monday, May 26</b>	Snack Bar open 9 a.m. to 2 p.m.	
<b>Tuesday, May 27</b>	French Onion Soup	
	Chicken a la King on Rice	1.10
	Roast Fresh Ham & 1 Veg.	1.25
<b>Wednesday, May 28</b>	Split Pea Soup	
	Breaded Flounder Filet & fr. fr.	1.10
	<b>Special</b>	
	Spaghetti w/Meat Sauce & Garlic Bread	
	All you can eat	\$1.00 plus tax
<b>Thursday, May 29</b>	Cream of Chicken Soup	
	Macaroni & Chopped Beef	1.05
	Veal Pattie Parmigiana & 1 Veg.	1.20
<b>Friday, May 30</b>	Manhattan Clam Chowder	
	Broiled Filet & 1 Veg.	1.10
	Braised Beef & 1 Veg.	1.25

## BROOKHAVEN BULLETIN

Published Weekly for the Employees of  
Brookhaven National Laboratory

CARL R. THIEN, Editor  
JEAN BURKE, Assistant Editor  
CAROL GOLDSTEIN, Copy Preparation

40 Brookhaven Ave. Upton, N.Y. 11973  
Telephone 516 345-2345

## LUV is Lovely

Come to Luv

STAGE II (Exhibit Hall)

May 23, 24, 25, 30, 31

For tickets call Ext. 3489

BNL employees - \$2  
Guests - \$2.50  
Students under 18  
and senior citizens - \$1

## Official & Special Events

Monday, May 26

Holiday - Memorial Day

Wednesday, May 28

Navy Meeting

BNL Lecture - Berkner Hall - 8 p.m.

Lab-wide Seminar - Berkner Hall - 3:30 p.m.

Friday, May 30

Theatre Group - LUV - Stage II - 8:30 p.m.

Saturday, May 31

Theatre Group - LUV - Stage II - 8:30 p.m.

Monday, June 2

Biology Symposium - Neutron Scattering for the Analysis of Biological Structures - Berkner Hall - (June 2-6)

Wednesday, June 4

Long Island Library Resources Council

## Arrivals & Departures

### Arrivals

Marc A. Barnett ..... Physics  
Mary Anne McGrath ..... Ph. & Gr. Arts

### Departures

Patricia G. Burkhardt ..... Medical  
Yvonne S. Jackson ..... Reactor  
David W. Juers ..... Biology  
Roland R. Keller ..... Physics

## English Classes

English classes will be suspended approximately three weeks beginning May 26. Notice will be posted when classes are rescheduled.

## CREF Unit Values

1974			
January	\$40.75	February	\$40.83
March	39.32	April	37.58
May	35.11	June	34.29
July	31.71	August	29.09
September	25.39	October	30.27
November	29.23	December	28.35
1975			
January	\$30.67	February	\$32.80
March	33.77		
		April	\$36.12

## Classified Advertisements

### Placement Notices

Each week the Personnel Office lists personnel placement requisitions, currently being processed. The purpose of these listings is, first, to give notice of all non-scientific staff positions being filled and, second, to give employees an opportunity to request consideration for themselves through the Personnel Office. In filling vacancies, the Laboratory's objective is to give first consideration to present employees, as follows: employees within the immediate group having the vacancy, employees within the department or division, employees within the Laboratory as a whole.

For further information regarding a placement notice, or to request consideration for an available position, contact Supervisor, Personnel Placement & Development, extension 2874 or 2882.

110. NUCLEAR ENGINEERING ASSOCIATE - Department of Applied Science.

111. SECRETARY - Department of Applied Science.

112. DESIGN ENGINEER - Mechanical Engineering Division.

113. GENERAL SUPERVISOR, ROADS & GROUNDS - Plant Engineering Division.

114. ROADS & MASONRY SUPERVISOR - Plant Engineering Division.

BARGAINING UNIT:

NONE

### Autos & Auto Supplies

72 TRIUMPH - 650 Bonneville, excel cond. \$100 firm. Artie. 744-7185.

68 JEEP - Commando wagon, 8 tires w/rims, sweet running V6, excel mech cond, lock hubs, roof rack, trailer hitch. \$1200. Ext. 4203.

67 MG MIDGET - New top, brakes, wire wheels, approx 28 mpg, runs well. 475-9364.

66 CORVAIR - Rear engine, 6 cyl, auto trans, satisfact running cond but needs new left front fender. \$125. Ext. 4219.

72 MONTE CARLO - Golden br w/convert vinyl top, new tires, clean, excel cond. \$2500 or best offer. Ext. 3679, 727-1012.

69 DODGE DART - 4 dr, 6 cyl, auto, ps, 27,000 mi. \$1395. 286-9260 eves.

4 TIRES - G79-14 4 ply polyester, used under 300 mi, \$100 for set, \$25 each; 2 Goodyear power Nutreads, 750-14 never used, \$30 for set. Titmus, 928-9078.

TRUCK TIRES - 2 Goodrich, 6 ply, 7-17.5, like new. \$30 for pair. Titmus, 928-9078.

69 BSA - Lightning 750 cc, excel cond, balanced engine, chrome & stainless goodies, windshield. \$1150. Ken, 475-4541.

61 VW - Rebuilt eng, body not so hot. Dale, Ext. 2022, 281-8579.

72 NOVA - 2 dr sedan, excel cond. \$1800. Joe, Ext. 4547.

74 FORD GALAXIE - 500, 2 dr ht, auto, vinyl inter & roof, ps/pb, air cond, must see. Sacrifice \$3100. 878-4366.

70 HORNET - 2 dr, 6 cyl, new tires, radio, high mi. \$495. Andy, Ext. 3806.

67 FORD FAIRLANE - Good cond, 4 new tires & brakes. \$250. 821-0080 after 6.

66 BUICK - Sport wagon, 9 passenger, 84,000 mi. \$275. 878-2577.

70 PLYMOUTH - Station Wagon, 383 engine, ac, pb/ps, roof rack, 70,000 mi. \$1250. Ext. 4532.

73 PONTIAC - Grand Prix, opera window, extras, immaculate. Sacrifice. 751-8097 eves.

55 T-BIRD CLASSIC - 2 seater, 2 tops, auto, 70,000 mi, excel cond. \$3000. 929-4681.

67 RAMBLER AMBASSADOR - 6 cyl, good shape. \$400. 924-3338.

63 PONTIAC - low mi, 68 eng, 3 spd, new starter, alt, regulator, batt, brakes, clutch, rad, heater, tires, etc. \$500 or best offer. Joan, Ext. 4393, 924-8595 after 5:30.

52 CHEVY PARTS - Engine, runs good, interior wood trim, some chrome, glass & hardware. 727-4363 after 5.

RIMS - 2-13" rims, 5 holes, \$3; 1-14" Ford extra wide rim, \$3. O. Booker, Ext. 4719.

74 HONDA - Auto trans, showroom cond, 600 mi, full street & dirt. 878-2399.

TIRE - 13" w/Chrysler rim, Ext. 4172.

### Boats & Marine Supplies

15' FIBERGLASS - 33 hp motor, trailer, \$600. 878-4214 eves.

14' FIBERGLASS - Sailboat, main sail and two jibs, not Sunfish type. \$500. 878-4214 eves.

21' FLEETWOOD - Open fishing skiff, center consol, 2 fishing seats. 115 Merc. Ext. 3120.

71 BOAT TRAILER - Cox, 1000 lb, good cond. \$125. Nick Satterley, 286-3791.

16' RUNABOUT - 28 hp Evinrude, canvas, trailer, ready for water, very good cond. 722-3938.

FIBERGLASS REPAIRS - From holes to scratches, reasonable prices, good work. 924-5344 after 6.

16' SAILBOAT - W/trailer, all fiberglass, dacron main & jib, easily trailered, must be seen. \$800. 924-5344 after 6.

60 JOHNSON - Outboard, 40 hp, very good cond. \$100. Ted, Ext. 2419.

### Miscellaneous

BED - Queen size, Sealey Posturepedic, mattress, box-spring, frame, headboard. \$125. 744-2745.

NEW ENGINE - 250 6 cyl, brand new. Charles, Ext. 2345, 286-2373 after 5:30

ROLLABOUT CART - For stereo or tv, adj width & folding ext for stereo speakers & record rack shelf. \$5. Ext. 4240.

73 24' PULLMAN TRAILER - Self-contained, sleeps 5, many extras. \$5500. Marie, Ext. 3155, 732-6137 eves.

FENCE - Heavy gauge, chain link, 250', 4' high w/ gate & posts. \$350. 281-6932 after 6.

BICYCLE - 10 spd, Schwinn Continental, 21". \$80. Ext. 3397, 929-6830.

DRYER - GE elec, 18 lg capacity, like new. \$100. 286-1715.

MEDICINE CABINET - 14"x22"x4½", still in carton. \$6. Mike, Ext. 4851.

LAWN MOWER - Jacobsen self-propelled, good cond, \$50 or best offer; kiddie tote back pack, \$10; hobbie horse, \$10. Frank, Ext. 3063.

CHAIR & LOVE SEAT - French provincial, need reupholstering but excel frames, make offer. Frank, Ext. 3063.

REFRIG - Westinghouse Coppertone, frost-free, 16 cu ft, 3 yrs, excel cond. \$150. 732-7570.

SLIDE MAGAZINES - Carousel 140 for Kodak projector, have 2 never used, \$3.75 each or swap for 80 s. J. Kopp, Ext. 3778.

FILE CABINET - Almost new, 4 drawers, HD, \$40. Joc, Ext. 4261.

VW TENT - Free standing or attach to bus, screened windows & door, excel cond. Joan, 589-5798.

STEREO AMP - Ayna ST-70, 35 watts/channel rms, w/manual. \$70 negotiable. Alan, Ext. 3028/4386.

HOUSE TRAILER - 15', 1972, tri-state, \$900. 281-1364.

35mm CAMERA - GAF L-17, 55mm, 1.7 Chinon auto lens, less 1 yr old. \$225. Titmus, 928-9078.

DEHUMIDIFIER - \$50, lawn mower, \$25; 18x12 braided oval rug, needs cleaning, \$20. R. Whisker, Ext. 3312, 399-1655 eves.

2 LAMPS - 40" white shades, green, black, white base. \$10 each. 281-7844.

ROLIFLEX - Camera, Xenotar 3.5 lens, excel cond. Ext. 2041.

2 RECLINERS - Matching upholstered contemporary, exposed fruitwood frame. Asking \$50. 584-6019.

COUNTERTOP - L-shaped formica marble, 9'x2'x6", coppertone sink, fixtures, spray, \$75. Coppertone 30" drop-in stove, \$50; auto fan, \$35. Ext. 4461, 589-5569.

CHILD'S CAR SEAT - Excel cond, orig \$38, yours for \$15. John, Ext. 2268, 281-2623.

BICYCLES - Boy's 26" Sears lightweight, good cond, \$20; girl's 24" Raleigh Spacerider, excel cond, \$40. 744-2017.

HIKING/CLIMBING BOOTS - Brand new, never worn, Vasque brand w/Vibram sole, leather lined, padded ankle. \$25 w/boot rack. Alan, Ext. 4386/3028.

CAMERA - Polaroid - Model 350 auto w/flash, timer, coupled rangefinder. \$35 negotiable. Alan, Ext. 4386/3028.

SNOW/ICE CRAMPONS - New SMC size y ½, fits size 8-8½, chrome-moly, hinged w/protectors, ideal for aerating lawns. \$15. Alan, Ext. 4386/3028.

200 BRICKS - 4"x4"x12", off-white finished, 3 sides w/mold for making caps. \$45. Fred, Ext. 4701, 475-4935.

PICTURE WINDOW - 38x68¾, excel. \$50. Ext. 4461, 589-5569.

DRAPERY - 3 & 2 pair, good for den or child's room, \$4.50 set; bedspread, not matching, \$3.50. 744-2017.

HALF KEG - Stainless steel, good for mooring buoy, water tank, etc, make offer. Gordon, Ext. 4613.

MAJORETTE BOOTS - White, size 6, almost new. \$6. Gordon, Ext. 4613.

BAVARIAN - Glass topped coffee table, gold braid base, matching end tables, \$150. 727-8052 after 5:30.

BASEMENT FURN - 3 piece mod red sectional, \$75; sm apt size bar w/3 stools & shelves, white/gold, \$45. 727-8052 after 5:30.

BEDRM SET - Green, dresser, armoire, dressing table, iron headboard, firm mattress. \$450. 727-8052 after 5:30.

SEWING MACHINE - W/cabinet, older Singer, \$35; table model, older Singer, needs work, \$20. 727-8052 after 5:30.

GIUITAR - Excel cond, vinyl case. \$15. 698-9465 after 4.

20 GAL AQUARIUM - Light, filter, wrought iron stand, 475-6938.

AIR PURIFIER - Electrostatic, for allergy, room size. \$60. 286-0497 after 6.

FULL SIZE BED - W/box spring, mattress, dresser, vanity & bench, chair, night tbl, \$90 firm. Charley, 281-5385.

BEAUTIFUL DRESSERS - 2 & 3 drawers, twin beds, chairs, kitchen & others, reasonable. Charley, 281-5385.

POOL TABLE - 4x7 w/balls, cues, bridge, \$165. Charley, 281-5385.

SHEETROCK - 3 sheets, \$2.50 each; asbestos pipe covering, approx 1", make offer. Greene, Ext. 4484, 286-0237.

BLK LAB PUPS - 11 wks old, wormed, shots, good pedigree. C. Nielson, Ext. 3935, 325-0968.

LENOX CHINA - 2 place settings, never used, Olympia pattern. 286-3679.

SECTIONAL - 3 piece w/chair, turquoise, \$150; 3 walnut living rm tables, \$25. 588-7989.

TANDEM - 2nd time, make offer. Ext. 3838, 924-3104 after 5:30.

SPEAKERS - Designatron PMC Mark II, perfect cond. \$30. for pair. Bob, 744-5096.

BELT SANDER - Burgess 2, runs well, needs new drive roller. \$10. Jerry Kinne, Ext. 3334.

MOBILE HOME - 12x60, 2 bedrm, full appliances, lg fenced in back yd, shed, etc, excel cond. 369-2136.

AIR COND - \$150. 665-5910.

GIRL'S BIKE - 3 spd, 21" hi-riser, like new. \$40 firm. 744-5261, Ext. 3121.

COUCH - Blk vinyl, 2 bolsters, like new. \$75. 289-3114.

IRON RAILING - 31', 2 end posts & fittings \$25. Ext. 4866, 325-1961.

SHAG CARPET - Pink/white tweed, 11x12. 751-6765.

BABY CARRIAGE - Good cond, \$10; alum storm door, needs glass, \$7; girl's 20" bike, needs tires, \$6. Frank, Ext.. 3532.

BRIDAL GOWN - Size 10, A line, worn once, cleaned & boxed, cost \$100, for happy June bride, \$15. Ext. 4028.

GIUITAR - Giannini w/case, strap & instruction. \$100. Ext. 4634/4667, 331-1397 after 5.

DINING SET - Contemp, walnut, 60" table, 4 chairs, 60" buffet, excel cond. \$300. Judy R., Ext. 2452, 473-1154.

TYPEWRITER - Royal portable, like new, \$20. Don, Ext. 3510.

COUCH - Antique swoonin', walnut, \$225; matching arm chair, \$65. 929-4681.

30 LAYING HENS - \$3.50 each, Barred Rockes & Rhode Islands Reds. Sautter, 924-3338.

CAMERA - Konica auto S-2, 35mm rangefinder, 45mm f1.8, excel cond, best offer over \$60. 941-9055 eves.

GUPPIES - Fancy-tailed babies, Red Delta father, golden mother. 25-75¢ pair. Louise, 878-4864, Ext. 3325.

Ads left out of this issue because of lack of space need not be re-submitted in order to run in next week's issue