

Science for Nicaragua Newsletter

Produced by the Nicaragua Committee of Science for the People

Volume 1, No. 6

November-December 1987

NEXO

UNI Publishes New Scientific Journal

With the financial support of a committee in Bologna, Italy, the National Engineering University (UNI) has begun to publish NEXO, the first scientific journal in Nicaragua's history. The first issue, "Year 1, No. 0," contains several long articles dealing in different ways with general questions of science and development in the third world, with special attention to Nicaragua's revolutionary situation. One of these articles ("The Olof Palme Seminar") is translated below. The journal also contains brief descriptions of recent scientific discoveries around the world, as well as reports on scientific and technological conferences in Latin America.

Issue No. 0 is a pilot issue, a milestone in Nicaragua's efforts to publicize its ongoing struggle for technological independence. As Italian engineer Donato Capozzi writes on p. 2 of NEXO, "It might be said, paradoxically, that it is precisely the economic blockade imposed by the U.S. ...that is forcing the technological sector of the country to adopt a creative attitude, whereas historically its role has been one of service of foreign technologies run by foreign technicians." This process has engendered a lively and complex debate within Nicaragua, and NEXO promises to become one of the best places to follow the debate as it broadens.

But the UNI will be able to continue publication of NEXO only with the help of the international scientific community. We urge those of our readers who know Spanish to subscribe to NEXO. A subscription form with full instructions is included on p. 7.

Editorial by Rector of UNI

The following editorial was published on the front page of the first issue of NEXO.

The National Engineering University, at its creation in 1983, established criteria for quality, discipline, and rigor as a solid foundation for the development of scholarly and academic activities compatible with the requirements of the national project. Academic activities in particular have received and continue to receive special attention because they direct the university's work toward social involvement and toward the future: they improve the quality of teaching, influence national development, and make the world's scientific and technological evolution accessible.

What has been accomplished by researchers, professors and students in our research center (DINOT), in the schools of chemical, electrical, and electronic engineering, of computer science, and in the physics and chemistry departments, is evidence that the academic activities that the UNI has proposed since it was founded can be carried out, even in the context of a survival economy forced upon us by foreign aggression. The meaning of this work is simply the motivation to maximum production of our best and most precious resource: intelligence.

But this creative and innovative activity...must be made public; it must be submitted to commentary, criticism, and emulation; it must be the object of a dialogue within and outside

the university. It must, finally, be able to express itself fully.

This journal is tying together all the branches of our academic activity; it is the broadest expression of our life, and it is the instrument of our dialogue. The UNI now has its own voice,

This journal, voice of the UNI, will express the form of institutional and national thinking about science and technology. The university is called upon to be the most qualified center of opinion in the country, where one can hear well-informed viewpoints on scientific developments in the world or on the adequate use of technology in our setting. This journal will always be the natural locus for expressing or reading these opinions and viewpoints.

Obviously, in this search for breadth, for quality, and for consistency, the journal opens its pages to contributions by other universities and national and foreign institutions to realizing these objectives. Thus, every issue will contain the message of fraternal solidarity that is in the concept of science and technology at the service of humanity.

July 1987

JUAN SANCHEZ BARQUERO
Rector, UNI

The Olof Palme Seminar

by Romulo Ballesterro (trans. R. Trippini)

The Olof Palme seminar on scientific and technological research and cooperation between Sweden and Nicaragua took place at the beginning of March. Reports were given on specific projects, areas and strategies of research, as well as on the prospects for scientific research in Nicaragua. The seminar was organized by the Ministry of External Cooperation, the Secretariat of Planning and Budget, the National Council on Higher Education (CNES), and SAPEC (the Swedish agency for external cooperation).

Seminars are ephemeral events. They stay in the limelight for a few days and then vanish, usually leaving behind two concrete traces: the body of the papers read, and the final report of discussions and conclusions, which then becomes the official reference and, sometimes, a useful working tool.

The seminar we are going to discuss left the first of these traces, but not the second; it was more fleeting than usual.

Since it did not have as specific purpose the framing of a shared or debated proposal about what science and technology can be in Nicaragua, the meeting had the nature of what is commonly referred to as a "colloquium"; its participants discussed among themselves their opinions on and results in different areas. Not much was said besides that which is to be found in the papers, except that expressed by some special guests, which apparently was not recorded.

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POSITION AVAILABLE: MECHANICAL ENGINEER OR MACHINIST

The UNI urgently needs someone to teach courses in Mechanical Technology, Instruments and Measurements, and Machine Tools. Spanish language a must. Please send resume *immediately* to Science for Nicaragua, 3217 College Ave., Berkeley, CA 94705. Preference is for mechanical engineer, but machinists with experience teaching are encouraged to apply.

Two Letters from Managua

Jennifer Strickler

Sept. 30, 1987

Dear SftP—

I'm working in the School of Social Work in the UCA, which is basically a program in community organizing. This semester my job consists of advising fourth year students on their monographs, developing a curriculum for a two-semester course on statistics, giving a refresher course to the faculty in statistics, and participating in a research project on social policy and popular participation in Nicaragua. There's very little knowledge about quantitative social research or methodology, so I am keeping quite busy and I feel that my skills are being well-utilized considering the conditions.

The School of Social Work was closed for several years after the Triumph because it was thought to be anti-revolutionary by definition. When the government realized that political economists could not solve all social problems, the school reopened with a new curriculum, and the first group of students will graduate this December. At this point, more than half the professors are internationalists.

The most rewarding aspect of working at the UCA is that the students are motivated and interested in learning. They take an active role in their education and, in spite of their poor academic preparation, they have intellectual curiosity and political awareness. It is a nice change from the apathy and individualism that I found in students in the U.S.

My biggest frustration is the lack of material resources. There are few textbooks, no Xerox paper, no funds for student or faculty research, and it is even difficult to find a working typewriter. The monthly shipments of materials from SftP make a huge difference to us, and they should definitely be continued in the future.

In solidarity,
Jennifer

Gil McCann

Dear SftP:

Things are still slow at the Escuela de Sociología. The course on SPSS [Statistical Package for the Social Sciences, ed.] for the computer has been postponed until December or later, and I currently do not have access to either computer. I am still assisting in the Statistics course, but have been asked not to lecture for awhile [until his Spanish is stronger, ed.]. My effort to get some books from Mexico failed, as they could not be found. I did manage to get 4 copies here (for a total of 5) of a good, useful text.

The students are an interesting contrast—they are even weaker in math than U.S. students, making it very difficult to teach them statistics. However, they are interested in life and the revolution and are quite outspoken. They are good at picking out problems in data and show that they can think about what they data mean. The one thing they're really short of is apathy. And given the lack of resources—one seven page pamphlet on probability, no text, little opportunity for homework—they have an amazingly positive attitude—as do most of the people I've met in Central America.

¡Aquí no se rinde nadie!

Paz con dignidad,
Gil McCann

Linder Peace Tour Visits Boston Area

by Gary Keenan

It is more than six months since Benjamin Linder was killed by contras in Nicaragua. But his work of bringing electricity to rural Nicaraguans continues through the efforts of his family and friends. Since June, the Linder family and some of Ben's coworkers in Nicaragua have been touring the United States, speaking to the public about Ben's life and death and raising money to complete the hydroelectric project in the San José de Bocay region where Ben was killed. They seek to raise \$200,000, and they have visited over 120 cities thus far. From October 14 to 18, Ben's parents David and Elisabeth Linder and their daughter Miriam were in Boston and Eastern Massachusetts.

Several Boston area activist groups formed a coalition to host the tour, among them SftN, TecNICA, CASA, NICA, and the Socialist Workers Party. The organizing committee began meeting in July, planning a series of 25 events in ten cities. During September and October, I served as fundraiser and regional coordinator for the Tour. In addition to the planning group of 15 people, about 50 volunteers from various organizations helped with individual events, transportation, and publicity.

Events on the tour ranged from appearances on radio talk shows, to a brunch at the home of community leader and former State Representative Mel King, to large public meetings in schools, churches, and synagogues. Community groups in Natick, Framingham, Gloucester, New Bedford, Worcester, and Lawrence sponsored events in their areas, all of which were coordinated through the SftP office. Audiences varied from 50 people at Harvard Medical School to nearly 500 at the Arlington Street Church in Boston. About 3000 people attended various events during the five days.

The impact of the Linders was powerful. David, Elisabeth, and Miriam Linder each tells Ben's story in a different way. But they share a determination to focus on their son and brother. "The Tour is not about our grief," said Miriam at one point. Over and over they spoke of why Ben went to Nicaragua, of his desire to use his engineering skills to help people, and of his accomplishments during his four years in Nicaragua. They showed slides and videotapes of the region in which Ben worked, one of Nicaragua's poorest. There are no paved roads, no electricity, no running water. Until the revolution there was no health care or education.

As David Linder showed slides of simple things we take for granted—a streetlight, a lightbulb in a classroom, a woman technician at the generator—the profound achievement of his son because clear, as did the enormity of the loss the family, and all of us, have suffered. A young man, whose early life was quite ordinary, chose to go to one of the least developed regions in the Americas to help people directly.

That he succeeded, that his success brought down the wrath of the U.S. government, illustrates the crucial character of the war over the future of Nicaragua. Ben's small scale electric generator was designed for self-sufficiency. It was owned and operated by the people of the region served, as part of the regional autonomy program of the Sandinista government. The contra claim, supported by our State department, that such plants are "military targets" expose the real goals of the contra war: to make Nicaraguans suffer for their independence, to force them to militarize and impoverish themselves in their struggle, and to set an example for others foolish enough to consider withdrawing from the U.S. sphere of domination.

"Ben is many things to many people," said David Linder during one of his talks. "He loved life, drew great satisfaction from his work and his friends. He didn't want to die. He knew the risks involved in his work, and he took them because he believed in the

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The UNAN-León: Needs of the Faculty of Science

Notes distributed by the Faculty of Science (1987)

[T]he NATIONAL AUTONOMOUS UNIVERSITY OF NICARAGUA at LEÓN, with a total of 4500 students, presently consists of seven faculties: dentistry, medicine, pharmacy, law, science, education (where high school teachers are trained) and the Facultad Preparatoria [see SfN Newsletter, Vol 1, No. 5].

The Faculty of Science was founded in 1963, beginning with the programs of Physics-Mathematics, Chemistry, and Biology. In 1968 Physics and Mathematics were divided into separate program, but in 1975 lack of student interest led to the closing of the physics program. A Physics Department continues to provide courses for the programs in pharmacy, food science, biology, chemistry, and mathematics.

Several areas have been designated special priorities by the government: Health, Agriculture, and Education. We (the Faculty of Science) are not prioritized, and this aggravates the already existing limitations in our programs.

The present situation

The Faculty of Science now has 500 students, of whom 225 are studying biology, 130 chemistry, 45 mathematics and 100 statistics...It's worth mentioning that the statistics program started in 1984...and graduated its first students in 1986. We also have a Master's program in Integrated Pest Management (the only one in Nicaragua), run in collaboration with the Organization of American States and Oxfam-England. This latter field is where we are most developed.

In February of 1986 a small Computer center was established, consisting of four personal computers. These are used for two purposes: teaching and research, and consultation with other institutions (also for purposes of research).

We are working on research in the following areas: biotechnology, medicinal plants, organic synthesis, and biological control. We also are developing the following areas: computer science, statistics, differential equations, water analysis, and numerical analysis. We have a total of 95 professors, of whom 18 are studying on fellowships in the United States, East and West Germany, France, Cuba, and the Soviet Union. Of these 95 professors, 33 are in the biology program, 29 in the chemistry program, and 33 in the mathematics and statistics programs. The Faculty is divided into nine teaching departments: Applied Mathematics, Physics, Pure Mathematics, Organic Chemistry, Physical Chemistry, Analytic Chemistry, Ecology, Botany, and Zoology, as well as the program in Integrated Pest Management.

Given the priorities of our government and the existing limitations, we see two alternatives, not mutually exclusive, for continuing our development in spite of the war: (1) Coordination with other institutions of joint work, and use of their facilities to improve the quality of teaching and research, and (2) International solidarity. This document speaks to the latter alternative.

Some Needs

1. Fellowship Needs

* To obtain the Master's degree in computer science, statistics, or differential equations, over a two-year period, including an intensive course in English (starting 1988).

* To receive short courses (6-12 months) in the specialties of those of our professors who already have the Master's degree and know English (starting 9/87 or 1/88).

* Fellowships for one or two of our professors, for a period of 5-6 months, with the sole objective of learning English. This could also be arranged in the form of an exchange.

2. Scientific Assistance

We are able to receive professional colleagues in any of the areas covered by our Faculty for short-term visits, preferably in January, February, March, and July, when classes are not in session. We are especially interested in having one or two professors visit for longer periods (6-12 months).

We can also use lab technicians in chemistry, physics, or biology, for short- or long-term visits.

3. Materials and Equipment Needed

Generally speaking, we need paper, stencils, typewriters, mimeographs, staplers, pencils, and projectors.

Here are some of the particular needs of the individual departments:

School of Mathematics

To deal with the shortages of texts for upper-level courses in mathematics and statistics, we are thinking of offset printing several texts, but for this we need: 8 packages of 40 bond paper, 10 packages of offset plates (for Cord) and developer, 6 boxes of 20" by 24" film for mechanical photography, 25 packets of developer, 3 gallons of fixer, and 50 kg of offset ink. We also need IBM compatible computers, software, diskettes, and paper.

For the reproduction of articles, tables, statistics, etc., we could very much use a photocopier. We also need books. [A list of specific books needed by each department is on p. 7.]

School of Biology

The Botany department is interested in continuing its project of support for teaching by producing quality teaching materials. We have already produced a good number of slides in color (Ektachrome) and black and white. In addition to serving the Faculty of Science we have also worked with the Faculty of Dentistry. We have at our disposal all necessary photographic equipment: darkroom, tanks, enlarger, and instruction manuals. Our present stocks of supplies are the following: 100 rolls of Ektachrome film, one gallon of Kodak color slide developer, Kodak 8" by 10" paper for black and white prints, one gallon each of black and white developer and fixer, and chemicals for slides.

We also have personnel trained in scientific illustration. We need to produce scientific drawings of the plants in the herbarium, for the entomological museum, and to illustrate scientific articles. We have the tools, including pens of all sizes.

But we don't have (a) India ink (black or in colors); (b) any other kind of ink for illustrations; or (c) water colors and pencils.

In terms of teaching and research, we need to strengthen the subjects of biochemistry, plant physiology and genetics, and to set up a laboratory for tissue culture.

We also need some used basic lab equipment for experiments in purification of proteins, DNA (in the biochemistry laboratories), and for research projects in tissue culture and genetics. [A long list of needed lab equipment follows, ranging from camera batteries to a minicentrifuge and a generator for electrophoresis. Details available from SfN.]

School of Chemistry

Needs: 20 each, 50ml and 100ml volumetric flasks; 6 ion-exchange columns; 100 boxes of filter paper of different sizes; fluoride-, calcium-, and chlorine-sensitive electrodes; 12 magnets, etc. [details available from SfN].

OLOF PALME SEMINAR, *continued from p. 1*

Even so, the seminar deserves to be discussed for several reasons. It did reflect what is being done in Nicaragua; there emerged alternative hypotheses on what could be done to promote autonomous development (hypotheses which deserve critical analysis); lessons were learned on how to structure future meetings. Even if it was not the first important seminar organized in the last years on matters of science and technology, the accumulated experience is not that extensive either.

It is worth noting that, despite all the difficulties to be found in Nicaragua, the organizers were able to print and distribute all the papers to be read in the seminar before it began; some were even translated into English. In this and other aspects, the "material conditions," as we say these days, were met, to the credit of the organizers.

In terms of structure, we can distinguish two levels in the meeting: that of project reports, and that which included global and area reports as well as presentations on the state, perspectives, and strategies in the development of science and technology.

Project Reports

This heading covers nine projects...[including] activities carried out in different time-frames: 3 years (two projects), 4 years (two), 5 years (three), and 6 years (one). These are not, therefore, short-term projects...

Before analyzing them it is convenient to make a few rather obvious distinctions for the sake of precision. Each of these projects was the product of strongly integrated binational groups. This is confirmed by the accounts of travels in both directions, of joint participation in distinct activities, of various interactions, etc. This, in conjunction with the specificity of the topics and the fact that in most cases well-known information and techniques were adapted to specific situations, does allow us to consider the reports as the products of homogeneous groups, regardless of nationality...

In our judgment, the reports were of varying quality, not because of the topics but because of the results and, above all, because of the congruence between these and the evaluations, conclusions, and recommendations. In our opinion, the most noteworthy work, without doubt, was one which clearly counts as "scientific research": namely, a study of medicinal plants, and this because of its lucid content and contribution of new knowledge and possible practical consequences—a balance seldom possible in works of this kind.

We could not help find it refreshing that in this study the single major difficulty consisted in the difficulty intrinsic to the scientific task, while most reports mentioned, understandably, financial scarcity, rotation of personnel, and low pay as major difficulties. This did seem to us to be a detail neither trivial nor incidental, and one deserving some reflection.

Some of these aspects were also apparent in a report on the earth sciences. The other reports covered activities in social health, microbiology, the collection of local data on solar radiation, and the use of "appropriate technology" for the improvement of productive activities or the utilization of waste products. [The article is accompanied by brief descriptions of each of the reports, which we have not included here for lack of space.]

Some of the reports sometimes failed to distinguish between the levels of scientific research, technological development, collection of data, and improvements in production. While it is true that everything has to do with everything else, the conceptual sloppiness in these fields allows anything to be subsumed under any heading. This is not serious as long as the question is purely one of terminology; but it can generate confusion when it comes to normative presentations: regulation of activities, "method-

ological" order, etc.

There can be no doubt that the semi-empirical operations for the improvement of the existing production processes could be regulated and subjected to methodology in advance; the necessary knowledge is already available, the available resources must be used in an efficient way, etc. If these operations are defined as being "scientific research," then by analogy—helped by loose language—one could believe that the preconditions for "efficient" research consist in regulative norms and methodological prescriptions. Something along these lines did surface in the discussion, and this is an issue to which we will return.

The reports highlighted a segment of the regular activity which goes on in Nicaragua around issues having to do with science, technology, and above all production....All the projects did include and develop activities of professional training and improvement, equipment, and participation in activities in Nicaragua and abroad.

Obviously, this stage as a whole described a fairly substantial corpus of works and premises for a possible vision of science and technology in Nicaragua. But up to this point, nonetheless, it remained a presentation of practical and fairly scattered activities whose evaluation and specific importance were to have emerged from the debate and even from polemics, since there was no lack of debatable assertions.

In the seminar's preparatory meetings there was consensus on the primary importance the debate was to have. The very fact of preparing, printing, translating, and distributing the papers well in advance was considered an important factor in achieving this aim. While this consensus was justified, it cannot be concealed that the intended aim was not achieved: the discussion slots were frequently taken up by lengthy readings from texts we all had in our hands, and the limited comment was of a marginal nature.

The aforementioned projects, by the very fact of existing and being carried out, are of sure value as ways to train personnel, collect and order information, set up equipment, and generate (or not) tangible results. The seminar did succeed in showing them in detail. The shortcomings we have noted do not, of course, detract from this achievement.

Area and Global Reports

This part of the seminar held the promise of being the most interesting one for those who were interested...in [how the specific projects corresponded to various] models of the possible scientific and technological development of the nation.

However, the lack of a debate again limited the meetings to the reading of known documents, with few comments. The chronicle of the seminar, then, comes to consist in an analysis of the papers alone. These papers did describe... problems and achievements in different areas, and ... provided a glimpse of alternative structures for "scientific and technological research policies." This last aspect is the only one that will be discussed.

A first observation on the reports could be this: the two areas most closely related with direct and concrete activities having immediate consequences for the life of humans (i.e. agriculture and health) are those that emphatically require the setting up of research regulatory systems....It must be taken into account that a good portion of the research carried out in these areas aims at the effective application of already known techniques to local conditions. In order to ensure the success of this research it is imperative to guarantee some conditions relatively "external" to the problems: availability of minimal resources, continuity of action, adequate selection of objectives, etc. All such elements can in principle be planned and regulated in an integrated way.

An alternative to this formula, which was implicitly suggested rather than explicitly defined in other papers, would consist in carrying on what is already generally being done: each

important area center elaborates its own research policy within a flexible general framework and according to a prioritizing of the most urgent necessities. This would imply a somewhat "decentralized" version of research policy, and would correspond to areas whose interactions with humans is mediated by more symbolic representations of the reality around them....

The global reports on diagnostics and policies—which represented at least the opinion and possibly the position of the agencies responsible for the scientific and technological structures of the nation—did coincide, in letter and in spirit, with the first of the above-mentioned alternatives and would extend it to the whole realm of science and technology. The resulting model might consist in a set of sectoral subsystems integrated in a national system of science and technology, with a hierarchical head which would formulate policies and executive bodies of various types.

On the other hand, the alternative model would consist in a flexible arrangement for the evaluation and promotion of activities deriving from research policies which have been framed, executed, and financed within each sector. The different sectors would not only execute policies established by hierarchically superior agencies but would also initiate such policies, as is presently happening in most cases.

As can be seen, in the seminar we are discussing there appeared, discreetly, hypotheses, possible mechanisms, and predictable alternatives inherent in the future of science and technology in Nicaragua.... [W]e believe a new meeting is needed in which such questions—so important for the development of Nicaragua—will be debated in depth. But, of course, without the scope or the cost of the meeting we have just discussed.

Recent Donations

SfN recently received two gifts that will allow us to expand our program in 1988. For the second year in a row, New England Biolabs Corporation, a longstanding friend of Science for the People, will be funding our work in Nicaragua. This year's grant is for \$3000, which translates into two full-time instructors for an entire academic year.

The other donation came—without warning—from the Nicaragua Exchange, the New York-based organization which over a period of four years sent nearly 2000 U.S. citizens to pick coffee and cotton in Nicaragua. No other group has done more to provide North Americans with an opportunity to witness Nicaragua for themselves, and many of us were saddened this year when the Nicaragua Exchange decided to end its operations. It was the Exchange that, through sheer force of optimism, made sure back in 1984 that a proposal to establish a Science for Nicaragua program was written. Even as it departs from the scene, the Exchange remains generous, distributing its residual funds to other groups working in Nicaragua. SfN received \$2500 of these funds, on the recommendation of Sarah Crome of Elders for Survival (see below).

Since we received these last donations we've been sleeping much better, knowing that we can completely cover the living expenses of four instructors for another year. In fact, since most of our instructors manage to raise some funds on their own, we are confident of our ability to support eight or nine instructors in 1988. On the other hand, our program is growing so rapidly—the UNI just accepted four more teachers for next year—that we are likely to have twelve instructors in Nicaragua by March. Regular readers will therefore not be surprised to see our usual fundraising box on p. 7. If you haven't yet responded to one of these boxes, there's still time to make a tax-deductible donation to help a colleague—or a student—work with SfN.

SfN to Absorb Elders' Program

The Berkeley chapter of SfN is currently negotiating with Sarah Crome of Elders for Survival to incorporate the Elders' Nicaragua program into SfN. As reported in the March-April issue of the newsletter, Elders for Survival has for two years been recruiting hydrologists to work with the Nicaraguan agencies concerned with water resources and the environment. The Elders plan to continue working with the program but believe, as do we, that much effort will be saved if we combine our resources.

Working directly on long-term development projects represents a new direction for SfN, which up to now has dealt exclusively with institutions connected with higher education. We expect to send one or two hydrologists a year to Nicaragua; they will participate fully in SfN meetings in Managua and in decisions affecting the future of the program.

SfN Office Opens in Managua

Actually, it's just a home, but three of our instructors and their families are living there, which makes it the best candidate for official SfN residence in Managua. Friends of SfN planning to visit Managua should plan to stop by. The telephone number is 660502; the Managua city code is 2. Billy Gills, a civil engineer visiting the UNI, is our official representative in Managua and is presently responsible for the office.

Now that our program has grown to nine instructors, it's hard to keep track of what everyone is doing. To keep from drifting apart and to compare notes, our team in Managua has instituted a monthly pizza get-together. Reports on these meetings are transmitted to Robert Van Buskirk in Berkeley. So far, no word has reached us on the quality of the pizza, but the nine are working to prepare an orientation packet for future instructors which should be available early next year.

LINDER PEACE TOUR, *continued from p. 2*

work and the people he worked with. All of us can learn something from his life and death."

The tour ended with a reception in the home of Abby Rockefeller and Lee Halprin in Cambridge. Stephen Jay Gould spoke of the need to recognize our own power to change the world and the example Ben Linder offered in this process. By the evening's close, the tour had raised over \$14,000, bringing the Tour total close to \$160,000. "This means we will reach our goal of \$200,000 by early November," said Miriam Linder. Most of the money raised in the Boston area will go toward buying a four-wheel drive truck to assist in bringing construction materials to the hydroelectric site in El Cuá.

SfN will continue to cooperate with EarthIsland Institute, the Portland organization that administers the Benjamin Linder Memorial Fund. This newsletter will carry updates from EarthIsland of the progress in El Cuá, as well as the activities of the Linders. Anyone wishing to contribute to the Memorial Fund can send a check made out to "Ben Linder Memorial Fund/EI" to EarthIsland Institute, P.O. Box 6443, Portland, OR 97228. Contributions are tax-deductible.

Gary Keenan is publisher of Science for the People magazine. Copies of the videotape on Ben Linder's life will soon be available for distribution: contact SfN for details.

Women in Science, Technology, and Medicine in Central America

Report on the first conference held in Managua, Aug. 24-28, 1987
by Sieglinde Snapp, Vegetable Crops Dept. U.C. Davis

Participating in this conference addressing women and science in the developing world was a privilege I won't soon forget. It was a school, a political fiesta, a bonfire. I only understood a small part of all that was going on around me amidst the 60 extraordinary women participants, but I will be digesting what I heard for a long time to come.

There were women from every Central American country except Panama, and a sprinkling from Mexico, the U.S., Canada, England, and Italy. The women from Central America (C.A.) were excited to have the opportunity to meet each other and to have an official excuse to visit Nicaragua. A group of the C.A. women attending immediately set about organizing for the future: improved intra-C.A. communication, networking among C.A. women scientists and planning for a second conference.

It's criminal, and not accidental, how isolated C.A. countries are from each other. How much more relevant to have scientists from the region talking to each other, rather than the U.S.-C.A. and European-C.A. contacts that seem to predominate now. For example, plant pathology labs in Nicaragua and Costa Rica have a lot to offer each other, yet such linkages are currently almost non-existent, and fraught with the real hardship of travel and communication among the countries of the region. For women, Central America solidarity appears to be even more precious and necessary for survival.

The participants were models for me: I want to keep growing in courage and in the ability to speak, and to be able to dance all night. And most of all to do work that relates to real problems of oppressed peoples. That seems almost a dream now that I'm back in the land of agribusiness. But I've had these glimpses of people who do real work with their skills, and I am going to hold on to that.

A speech by one of the conference organizers, Dr. Ann Hibner Koblitz, summarized concisely and engagingly a historian's view of women's involvement in western science. She spoke of the first doctorates earned by women (which were in 19th century Russia, in mathematics), and discussed current debates on how scientific inquiry has been constrained by gender roles, and by the narrow, patriarchal view of science as a process of dominating nature. Her discussion defined a history of women and science that was frequently echoed during the conference. At other times, this history contrasted sharply with the picture described by other speakers of women and science in C.A. today.

A historical view of women and science was also presented by a keynote speaker from the Nicaraguan government, Tomás Borge. He spoke of the violent persecution women in science have faced, from the burning of women medicals and wisewomen as witches in the European middle ages to the torture of women students under Somoza. He built in stinging tones the case for the full use of women's skills and knowledge in Nicaragua today.

This conference, and the loud, welcoming Nicaraguan media coverage, was solid support in the daily struggle we face to "lift as we climb" (from the motto of early Black women's clubs in the U.S.). Thanks are due to the dual sponsors of the conference, the Kovalevskaja fund (for women in science in developing countries - 6547 17th Ave., Seattle, WA 98115) and CONAPRO, the organization of Nicaraguan professionals. The women chemists, doctors, agronomists, engineers, mathematicians, geologists, and educators of Central America are in ferment; I look forward to seeing what will happen next.

As this issue was going to press, Sfn received a detailed report on the conference from the Kovalevskaja foundation. Excerpts will be included in the next issue of the newsletter.

Publications Received

'Plan Económico 1987': INIES (Inst. Nic. de Invest. Econ. y Sociales) 242pp.

'Participatory Democracy in Nicaragua': 1983, ~250pp, in English.

'Proyecto DINOT: Plan de desarrollo de las fuentes no convencionales de energía en Nicaragua', Organismo di Cooperazione Internazionale, 1986, 46pp.

Publications of DINOT (Departamento de Investigación y Orientación Tecnológica) of the UNI, Apartado SV-30, Managua:

1) 'Biogas: Estado de la Tecnología en Nicaragua', Feb. 1986, 40pp.

2) 'Consideraciones Teóricas Sobre La Planta Solar de "Las Maderas"', July 1986, 45pp.

'Informaciones Agropecuarias', Midinra, Apdo. Postal A-227:

Año II No. 15 March/April (20pp); Año II No. 16 May 1986 (16pp); Año II No. 17 June/July 1986 (16pp); Año II No. 20 October 1986 (24pp); Año II No. 21 November 1986 (28pp); Año III No. 22 Dec/January 1987 (20pp); Año III No. 23 March/April 1987 (54pp).

Publications of the Oficina de la Mujer, Ministerio de la Presidencia, Apartado 5714, Managua, Nicaragua:

1) 'Inventoria de Proyectos Para La Mujer en Nicaragua', May 1987, 83pp

2) '10 Años de Investigaciones Sobre La Mujer en Nicaragua 1976-1986', Dec. 1986, 61pp.

3) 'Obstáculos a La Promoción y Aplicación de la 'Convención Sobre La Eliminación de Todas Las Formas de Discriminación Contra La Mujer': Caso de Nicaragua', Feb. 1987, 43pp.

4) 'Descripciones de Organizaciones y Proyectos Para Mujeres En Nicaragua', July 1986, ~120pp (report by the Swedish authority for International Development).

Periodicals

'Nexo': Quarterly publication of the National Engineering University, July/Sept 1987 issue, Vol 1 No. 0, 20pp

Subscriptions: Send \$25/yr to:
Revista Científica UNI, Apartado Postal SV-30, Managua, Nicaragua (Subscription form on p. 7).

'Encuentro', a trimestral publication of the UCA, No. 29, Sept/Dec 1986, 92pp

Subscriptions: \$21/yr to:
Universidad Centroamericana, Revista Encuentro, Apartado Postal 69, Managua, Nicaragua.

'Envío', a monthly publication of the Instituto Historico Centroamericano

For English language subscriptions send \$27/yr to:
Central American Historical Institute, Intercultural Center, Georgetown University, Washington, DC 20057.

UNAN-León: Book Requests (see article, p. 3)

School of Mathematics:

- R. V. Churchill, *Variables Complejas y sus Aplicaciones* (Mexico, 1978)
- R.V. Churchill, *Series de Fourier y Problemas de Contorno* (Madrid, 1966)
- H. L. Royden, *Real Analysis* (1968).
- S.D. Comte, Carl de Boer, *Análisis Numérico* (Mexico, 1974).
- E. Kreysig, *Introductory Functional Analysis with Applications* (1986).
- M. L. Boas, *Mathematical Methods in the Physical Sciences* (1983).
- Boyce and diPrima, *Elementary Differential Equations and Boundary Value Problems* (1986)
- P.R. Adby and M. H. Dempster, *Introduction to Optimization*
- M. H. A. Davis, *Linear Estimation and Stochastic Control*.

School of Biology:

- R. Malmberg, J. Massing, I. Sussex, *Molecular Biology of Plants, a Laboratory Course Manual* (1985)
- W. B. Jakoby and I.H. Pastan, Eds. *Cell Culture: Methods in Enzymology Vol LVIII* (1979)
- R.A. Dixon, Ed. *Plant Cell Culture: a Practical Approach* (1985)
- R.K. Scopes, *Protein Purification* (1982)
- B.D. Hames and D. Rickwood, Ed. *Gel Electrophoresis of Proteins, a Practical Approach*. (1981).

H. E. Street, Ed., *Plant Tissue and Cell Culture* (1977)

The lists are followed by the comment: "This is obviously just an indication of our needs, but any undergraduate text in mathematics, biology, chemistry, and computer science is welcome."

Please excuse misspelled names, etc. Titles listed in Spanish are presumably needed in Spanish-language editions.

It may be possible to send donations of books specifically for UNAN-León through the sister city committees in New Haven and Berkeley and the sister state committee in Minnesota. Write SfN in Cambridge for details.

Science for Nicaragua Newsletter is produced by the Nicaragua Committee of Science for the People, and is distributed free of charge to members of the Science for the People organization. Tax-deductible contributions should be made payable to **Science Resource Center**.

This issue was produced by Michael Harris, Roberto Trippini, and Leslie Fraser.

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CNES Director speaks to foreign visitors

On July 24 and 25, 1987, on the occasion of the First International Book Fair in Managua, members of Nicaragua's Sandinista government held a "Face the People" session with visiting publishers and editors. "Face the People"—*De Cara al Pueblo* in Spanish—is a kind of public question-and-answer session which has been held weekly in different parts of Nicaragua since shortly after the overthrow of Somoza. Questions generally reflect local concerns, in an effort to lessen the distance between the population and its elected government. On this occasion, however, questions were posed by foreigners and dealt with the whole range of conditions faced by Nicaragua.

Presiding at these meetings were President Daniel Ortega, and Interior Minister Tomás Borge; other government ministers answered questions in their specific domains. Among these was Dr. Joaquín Solís Piura, Minister-President of CNES, the National Council of Higher Education, who responded to a general question on the current situation in Nicaraguan higher education. We reprint some of his remarks below. A more extensive account of the meetings can be found in the September 1987 issue of *Envío*, from which this article is taken. (See p. 6 for details on how to order *Envío* and other Nicaraguan publications.)

"[W]e have reorganized the whole system of higher education since the revolutionary triumph, giving priority to the careers that are most useful for the country's development. Before the triumph, 70% of our students were in law, humanities, arts and letters and economic management, and only 30% in the more vital areas of engineering, agronomy, education and medicine. Immediately after

the triumph, we took up the task of correcting this and we can now say that we have totally reversed the situation. Now we have 68% of the students in the priority areas instead of vice versa. At the same time, we reviewed all our study and curriculum plans, so that they now respond to the national reality and not to plans and programs imported from other countries outside of our scientific reality, technology, and general development.

"In quantitative terms, between 1979 and 1983 we grew from 21,000 students to 34,000. We went from some 450 full-time professors to 1,500 now. We increased our physical plant, our laboratories, our libraries. Today we have around 5,000 students on scholarships within the country and 3,000 abroad. Before the triumph there were no scholarships either internally or internationally, not even one. The 3,000 who are studying abroad now are in 27 different countries, studying 180 majors that don't exist in Nicaragua.

"We must frankly admit, however, that we have huge problems, as does our country as a whole. Since 1984 we have seen our enrollment shrink, coinciding with the worsening of the war. Right now we have 27,000 students, 7,000 less than we had in 1983. According to our calculations, based on projections of enrollment at the secondary level, we should have 56,000 students today. The war has caused us to lose almost half of the students that we should have had. We don't include this in the calculations of the war, it's not quantifiable, but we're talking about 25,000 to 26,000 professionals we should have been training who are not studying because of the war, because they are fighting, or because of the economic crisis, which doesn't permit all those who want to study to be able to go to the university."

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