

Science for Nicaragua Newsletter

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The Roots of Nicaragua's Economic Crisis: Part I of an Interview with Robert Sutcliffe

SfN was fortunate to have British economist Robert Sutcliffe among our instructors in 1987. Sutcliffe, most recently a visiting professor at the University of Massachusetts (Amherst), has published widely on questions of development and the international economic crisis; his most recent book is The Profit System, written jointly with Francis Green. SfN's Boston chapter interviewed Sutcliffe in Boston this January, shortly after his return from a year of teaching in the Sociology Department of the Universidad Centroamericana (UCA). We are grateful for the opportunity to share his insights into the difficult situation Nicaraguans currently face, and their hopes for development in a future free of aggression by the United States.

SfN: Let's start by talking about your background as an economist, and how your work in other countries might be relevant to what you saw in Nicaragua.

R.S.: I've always specialized in developmental economics, and in that sense I've always been interested in the third world. I worked in Cuba for a year or so, in the Ministry of Forests. I've done a few short-term consultancies in Guinea-Bissau and Peru. And then a long time ago, before I was an economist, I worked in what is now Zambia and Zimbabwe, in a social research institute; that's what really got me interested in the first place in economics. But this is the first time I've ever taught in a third world country.

When I decided I wanted to work in Nicaragua, I decided that I would much prefer to be a teacher than to be an economic consultant or adviser. For two reasons. One is this: the nature of the economic problems was so huge that there was no correct advice that anyone could give. I admire the people who are there trying to work and are constantly suggesting things to do; it's an incredibly difficult situation. The more positive way of looking at it was that in general foreign advisers are a bad idea. It's much more important that third world countries develop their own technical professional resources. The people who give economic advice which affects the lives of other people should be in some way politically answerable to the societies in which they live. In that sense, it's more important to teach people in Nicaragua to be economists than to go and *be* an economist. I don't want to disparage the work of anyone who's working there as an economist, but that's one of the reasons why if you can make a contribution by teaching, it's a very useful one.

SfN: Was this principle on which you based your decision to teach confirmed by your experience in Nicaragua?

R.S. Well, I certainly confirmed that I was glad I wasn't responsible for making any economic policy! That has really to do with the state of the Nicaraguan economy. Everything you could imagine is going wrong. Production is falling, productivity is falling, there's hyperinflation, people are leaving productive jobs and going into unproductive jobs, there's a decline in the standard of living, in the national income, in investment. Less and less attention can be devoted to long-term development projects, more and more the nature of economic policy-making is simply to survive until, it used to be next month, then it was next week, and now it's probably tomorrow. What's been happening because of a lot of factors, which I'll go into in a minute, is that the policy makers are increasingly confined into a small number of alternatives, and lose control of what happens in the long term by being obliged to control all the time what happens in the short term.

I don't think Nicaragua is special in that sense. It's partly special, but you can find this tendency in just about all of the third world. It's intensified in Nicaragua because of the aggression and a number of other factors. Because of the aggression, the political emergency, the consequences of the revolution and so on, one sees this tendency which exists in many other countries of the third world, the closing of the horizon. It's a very general phenomenon. Third world economics is more and more emergency planning. In Nicaragua that's largely because of the war, in some other countries it's because of famine conditions, in other countries it's because of other kinds of wars, international wars, civil wars; or because of the debt crisis. So the idea of development economics as being a way of outlining long term plans for whole countries is more or less dead. It operates in China and India, but in the vast majority of African countries, in most Central and South American countries, it doesn't operate at all any more.

Governments decide a policy today in order to survive for a week, and maybe in a week they change the policy because it doesn't work or because there's some new emergency. That's a general development within the world, from which Nicaragua suffers especially for a number of reasons. One is because it's an export-oriented economy that produces crops for which the market is almost universally bad. That's a phenomenon which has nothing to do with the war or the revolution, it would exist anyway. It's made much worse because of the war, which makes them stop producing even those disappointing export crops in a number of areas. Because of the actual incursions of the contras they have to abandon certain areas of land. The fact is that three exports have been almost completely removed by the war: shellfish, which was quite profitable; gold, because the mines are in areas which see big contra incursions, and forestry. And although none of those was the major export, they all were a way of diversifying exports from the old traditional crops, and they've had to stop entirely. So the old traditional crops which have been carried on to some extent have all been doing badly on the world market.

The second factor is the effect of the war itself. Direct effects in the sense that it's stopped production in these areas. Indirect effects in that in order to fight it the government spends half the budget just on military spending and a lot of the other spending is indirectly military spending. That means that a vast amount of what the government spends is non-productive in the economic sense. That's one of the major sources for inflation, which then produces another indirect effect.

If you have hyperinflation, then real wages fall extremely rapidly. So it becomes no longer rational to work in productive jobs with a fixed wage. In order to live people are obliged to get involved in some market activity of their own, i.e. the so-called informal sector. Nobody in Nicaragua can live without being involved in that sector in some way or other, at least through family, or connections or whatever. You couldn't live on the Nicaraguan wage. I'm not saying that as somebody expecting a high standard of living. That is, for anybody in Nicaragua, they could not live on the Nicaraguan wage.

continued p. 4

The Development Project of the National Laboratory of Solid-State Physics (LNFS)

The following article is extracted from a development proposal presented in April 1987 by the Solid State laboratory at the School of Physics of the National Autonomous University of Nicaragua at Managua (UNAN-M).

ABSTRACT (prepared by M. Toledo-Quiñones, Boston): The project consists in the development of a light-sensitive semiconductor device. Several steps are needed in the construction of such a device. Minimum facilities to use low-pressure chemical vapor deposit techniques are available. Other techniques to be used include optical spectroscopy and X-ray diffraction measurements. All equipment has been donated by solidarity committees and universities in France and Sweden.

It is also expected that the project will develop some new laboratory facilities, and improve some of the existing ones, needed for the solution of problems that usually appear in this kind of project. It will also contribute to the development, on the part of UNAN staff and students, many skills that are required for more ambitious future projects and research.

PRESENTATION OF THE EXPERIMENTAL PROGRAM OF THE LNFS

One easily appreciates that the solution of the technological Macroproblem, which is the key to the development of our productive capacity, involves levels of decision making within and outside the structures of the educational system. Part of the solution has to come from each of these levels.

Many countries have successfully confronted this challenge before us, and although the responses were sought according to different political perspectives (e.g. Brazil and Cuba), the solution ... always involved the vigorous growth of scientific research.

For us, it is social practice that modifies human consciousness and the practice of scientific work, which gives to the scientist the capacity and self-confidence needed to confront the difficult technical problems which we must solve in order to achieve technological independence.

Within the university, research guarantees that professors take part creatively in education, averting the specter of bookish knowledge. For their part, science students are stimulated through incorporating themselves actively in a profession which promises to be an adventure which involves them directly in the struggle for national liberation and against technological dependence...

In science and technology, we want to develop various experimental skills in the treatment of materials typical of modern technology, in the measurement of their properties, and in their manipulation in order to produce desired effects. It is illustrative to point out here that the different methods of measurement which we will use in our laboratory are those which, in the various industries and services of the country, tend to be the most up-to-date technology (e.g. optical spectroscopy in INMINE, X rays in medicine,...) Thus, as a first important "subresult" of the program, we will have qualified scientists who are developing high technology equipment relevant to the needs of the country.

The experience obtained during the program's development will provide us with scientific personnel with great experimental skills, who are capable of dealing successfully with programs of greater scope: for example, the development of solar cells.

In terms of education, the professors involved in this work will have at their disposal a wealth of original examples, originating in practical problems, which they will have to solve in the research laboratory, and which they will be proud to transmit to their students. This will be especially useful for the new curriculum requirements, which involve a large number of courses in experimental physics. At the same time, it is expected that the new equipment, used daily in the research laboratory, will become

a part of the experimental and course work for advanced courses, in this way achieving a constant updating of their contents.

Finally, it may be mentioned that the final product of our program can be refined in the future for industrial use.

Concretely, the project consists in the development of a light-sensitive semiconductor device, starting from an ingot of commercial silicon, which is a semi-processed material, and ending with a device which will generate an electrical signal in the presence of visible light. It will also be necessary to develop techniques for the study and control of each of the intermediate steps, as well as the final product.

It is possible that the final products will be less efficient than the equivalent commercial devices. Nevertheless, at a later stage it will be possible to refine the technical processes developed in our laboratories in order to improve the quality and specialize the products in order to make them of acceptable quality and with previously established characteristics: solar cells, infrared detectors, photocells, etc.

In order to carry out the proposed program the participants will have to acquire work habits, experimental skills, and theoretical knowledge which will complete the basic academic preparation provided by the five years of the physics curriculum.

Like all work in research, this generates a natural dynamic of *superación* [improvement] of professional qualifications within the work group. This form of scientific *superación*, intimately tied to work, is superior to the method of taking isolated courses. The latter, even when they are well conceived... lack immediate applicability and the professional student quickly loses motivation and stores the knowledge obtained in an encyclopedic form. When, on the other hand, the courses in *superación* are given in an adequate work context and an environment of self-*superación*, as in a research group, they are perceived as an immediate necessity and multiply the motivation to learn....

The medium-term planning of a research program, with dates and methods detailed, is usually very difficult to fix in advance. In our case the weakness is still greater: we are developing in a country at war; we cannot count on a fixed budget, but only on steps to channel donations; and the free time at our disposal has to be discussed each semester, taking into account such important matters as the administrative and teaching needs of our School....

In spite of this, we estimate that our program can be carried out in approximately three years. In making this estimate, we have assumed that certain of the needs of the group will be satisfied in the best possible form. For example, we have assumed that (1) The School will continue to grow at the rate of one or two new professors per year; (2) The solidarity from which we presently benefit will continue at its present level; (3) Research will be prioritized relative to administrative tasks; (4) The academic load of professors active in research will be kept relatively low; (5) Proposals for academic *superación* will be considered as arguments of great weight at the moment of planning the annual academic *superación* of the faculty.

Report from Ibor Briones

Chilean economist Ibor Briones taught in the economics department of UNAN last fall. He reports on his experience:

There is a clear crisis in university education in Nicaragua. The causes are several: the war, the backwardness in which the Somoza family left the country, and the inexperience of many of the people currently running the universities, as well as the lack of economic incentives for personnel and professors.

We found a university system with an incredible instability. People are always leaving for better-paying jobs, or have difficulties stemming from their need to work other jobs part-time.

This is where I believe Science for the People and other international projects can play an important role in supporting

Hydrology and Environmental Projects

higher education. Bringing teachers from other countries has made a clear contribution to the educational process. In my case, I believe I have been able to raise the level of knowledge of macroeconomics of six teachers, who will later teach other students. My approach was to work out a plan on the basis of what they think is important, and to add themes that seem important to me.

For example, I have experience teaching macroeconomics. Most of my students had a very good background in political economy; others have been trained in econometrics and quantitative methods. So my macroeconomics course was designed to combine political economy with econometrics and mathematical techniques. I believe this method was successful in improving the skills of my students in each of the groups.

A Lack of Resources

One of the main problems in some courses has been the lack of resources of all kinds: good standard books in statistics and econometrics, mimeograph machines for distribution of homework assignments, and so on. Many professors don't even think of teaching some of the more technical subjects, where the lack of resources creates especially serious problems.

For this reason, I believe SftP should send fewer teachers but more material resources: photocopiers, books, paper, ink, mimeographs, and typewriters. Some of the books needed by the Economics department include: *Econometría*, Johnston; *Modelos Econométricos y Pronostico Económico*, Pindwick and Rubinfeld; *Macroeconomía, Teoría y Política*, W. H. Branson; *Ciclos Económicos*, Kalecki; *Estadística*, Freund.

Another way of stimulating university education would be to organize research projects with Nicaraguan professors, who could present their findings to local science committees. It would be important to provide some funds to supplement researchers' wages, with a basic initial stipend to get them started. My feeling is that some teachers have a lot of potential as researchers but the resources to support their work are lacking.

An added note: I think that SftP should try to maximize the efficiency of the people supporting Nicaragua's universities, rather than try to increase the mere number of instructors. It might be that a smaller number of contributors, with more material resources, better living incomes, some orientation, and better organization at the beginning could help instructors in Nicaragua work more efficiently.

Some Surprises

I learned a few things working here that surprised me, even though Spanish is my native language:

1. Some people in Nicaragua tend to believe that foreigners don't need any help in orientation or anything, since most foreigners are wealthy! (I noticed this at the UNAN). SftN should try to make them understand this isn't true!

2. Some people in Nicaragua are shy and take a long time to invite you to their homes. So be patient. You may not even be invited for tortillas during the first three months.

3. Nicaraguans put a lot of effort into dressing neatly, and they don't like badly-dressed foreigners. So it is important for them to be respected in this matter.

4. It's sometimes hard to work with students because, when things get hard, the tendency of Latin Americans (speaking as one myself) is to "question the quality of the teacher". Proper support from department heads should be asked for.

5. There is a lot to improve in Nicaragua just by being organized. So stick to your guns, ask students to be punctual, mark fairly, check their attendance, and don't allow cheating.

6. Try to enjoy your free time. Go to the beach, if possible, relax, try to dance a lot, and always keep a big store of patience.

As announced in Vol. 1, No. 6, SftN has now taken responsibility for a hydrology project initiated in Nicaragua by Elders for Survival. The following is a list of projects sent to us by Jim Albrecht, who has been working in the Elders' project since 1987, together with Gene Enyart. The list is based on discussions with officials in IRENA, the Institute of Natural Resources and the Environment. SftN hopes to hire advisors to fill some or all of these posts; for information, write our Berkeley chapter (address p. 7).

Projects for Hydrologist

1. **Determine Safe Yield from Lake Asososca.** Based on the historical record, Lake Asososca can continue to be a major source of water for Managua, but at a rate of pumping well below the present. The cone of depression from pumping the lake has reached below the level of Lake Managua, so that inferrably Asososca will be receiving Lake Managua water and become contaminated (*Lake Managua is heavily polluted by chemical waste and unfit to drink*, Ed.). A study of the affected area is needed to determine the maximum extraction rate which would allow recovery of Asososca to above Managua and then maintain it there.

Were a vehicle available for field examination, and perhaps also a current meter for measuring runoff, this could be done on the basis of a water budget of surface runoff, infiltration, evaporation, and ground water recharge. A lot of detailed work would be involved, though various levels of generalization of land use and the effects on infiltration are possible. There is enough historical data in Managua to permit this, though it is not readily available.

2. **Examine intrusion of Lake Managua water to ground water of Managua city; establish necessary monitoring program.** Some cones of depression from pumping wells in Managua reach below the level of the lake—inferrably there is or will be flow from the lake to those wells. Movement of contaminated water must be monitored in order to develop strategies for maintaining water quality in the ground water body. Since monitoring wells will be needed, this project would identify the probable best places for such wells should they become possible.

3. **Examine dynamics of infiltration of lake and sewage water to ground water under present and proposed means of sewage and other waste treatment programs.** Currently, raw sewage is effluent on the shore of Lake Managua and is presumably in part moving to those wells near the lake. A line of wells is being drilled between Managua and Lake Nicaragua for irrigation and water supply. Gene Enyart has made several proposals for sewage disposal, including for crops and recovery of land on the banks of Lake Managua for farming. He has proposed that new residential development include villages along the line of wells, with sewage used to irrigate nearby crops. All these proposals require study of the dynamics of infiltration of lake and sewage water, including the characteristics of near surface substrate as they pertain to filtering, absorptive capacity (cation and anion exchange capacities, adsorptive properties of the substrate materials), although the hydrology can be examined independently. The ability to prove the near surface materials would be necessary—not reliably available here.

4. **Extend study of subterranean water resources in León-Chinandega area.** It is possible that a computer model using daily precipitation data could be developed that would permit an adequate characterization of the ground water resource. This is a long shot, however, since existent data on well levels is limited to 2-8 observations per year for perhaps 50 wells, for the period 1968-78, while data on extractions for irrigation and other uses for that period is scarce. More practical would be a definition of monitoring needs and costs in order to permit a satisfactory resource evaluation in the future.

continued p. 7

SUTCLIFFE, *continued from p. 1*

That means that everybody is forced to do something else. That causes problems of absenteeism, of people leaving their jobs, people moving from productive work into unproductive work. Not that all the informal sector is unproductive, but nonetheless a lot of it is, because it involves finding yourself a little space in the distribution network, a proportion of the value which is produced somewhere or other. That's another area in which the war indirectly produces problems.

I'll give you an example of the wage question. I was in a friend's car and we gave a ride to a nine-year-old boy whose activity was every day to go to the market and buy a box of 100 pieces of *chicle*, chewing gum, for 38,000 cordobas. He would then sell each one for 500, and that gave him a sum total of 50,000 per day. That makes 12,000 per day, which is 360,000 a month, which was a little bit more than the head of the sociology department in UCA gets. That distortion is universal. So a nine-year-old boy who sells one little box of *chicle* gets more than somebody in a high-level professional job. Now there's no doubt that produces a most incredible kind of economic distortion...

Then you have the U.S. embargo, which means trading becomes more difficult, it's more difficult to get loans from international banks, Nicaragua is faced with less generous facilities from international financial institutions, etc. The U.S. has vetoed a number of loans to Nicaragua. And it also makes it very difficult to get spare parts for old North American machinery. So that means they just break down more often and it's very difficult to repair them, etc., and all that has quite a major effect as well.

And then, on top of that, you think about a country which is in a process of major social and political change, which hardly ever produces immediate short-term increases in economic development and productivity. It's always disruptive in some economic sense. That's part of the background which explains why the Nicaraguan economic problem is so great.

You can't say that there's a policy that would be better than the policies that are being pursued. You can see numerous ways in which the policies that are pursued lead to economic problems. But that doesn't imply that if the government pursued different policies that they would avoid economic problems. It would simply be that a problem that is objectively determined from outside would take a different shape than the shape that it takes at the moment. At the moment, for example, you have hyperinflation, with a rapid reduction in real wages, because the government controls the money wage and doesn't increase it in line with inflation. Now if the government were to increase the real wage in line with inflation, which would maintain the real wage, it's hard to say what would happen. Almost certainly the inflation would be more rapid than it now is. On the other hand it might to some extent cut down the flow of people from the productive to the unproductive sector. It's difficult to say.

That's why economic policy-making at the present time is such an extremely difficult question, and it's another reason why I tend to be skeptical of the function of economic advisers. What can one say that would make things better? In the end, it's a political question, an international political question and a national political question.

At the moment there's no way you could make the economy healthy. The question is how the unhealth would display itself.

SfN: Would you say the planners have a good sense of what's happening on a day-to-day or week-to-week basis?

R.S. That's a difficult question. Some of them clearly do, but among political leaders there's some tendency toward economic wishful thinking, to deny some of the really uncomfortable economic realities. Also, there is a failure to see some of the interconnections. I'll give you an example of that. At least a

year ago, and still six months ago to some extent, a lot of the political leaders were making frequent statements against the informal sector. But that's unrealistic. When you have a situation where real wages in the formal sector are falling as fast as they have been, and the real wages are to some extent controlled by the government—the government controls the money wage and can change it if it wants to—then it's not realistic to blame people for going into the informal sector and saying that they're ducking their revolutionary duties, because survival depends for many people on going into the informal sector. That's changed a little, there's been a real rethinking of that, but that illustrates a kind of voluntarism, that people ought to be doing what the government would really like to happen, even though there aren't the objective economic conditions in which they can rationally do that.

Now there are a number of intellectuals and a few politicians who are writing in a more accommodating, even a more constructive attitude toward the informal sector. The idea is that the informal sector is small-scale traders. There's no reason they should be against the revolution, because it's a revolution of small people and we should actually begin taking their problems as part of the revolution.

SfN: Is the informal sector providing some services that the formal sector is unable to provide?

R.S. Absolutely. In transportation tremendously so. But then part of the demand for transportation is because of the less productive aspects of the informal sector. Transportation is often that people want just simply to move goods from one place to another in order to get a better price. But there's a huge demand for transportation that can't be met by the formal sector, because there isn't enough investment money. So anybody who has a van converts it into a means of livelihood. It's a very good means of livelihood in Nicaragua. One can earn far more driving a van around than in any normal salaried job.

SfN: What kind of informal activity would a high-level professional be involved in, typically?

R.S. Professionals are more likely to be in a position where they don't have to be in the informal sector; they can get money from outside. Many of the people I knew at this level who stuck in their jobs were able to do so because they had economic support from relatives and friends in the U.S. That's an important point to understand what's going on in Nicaragua. I saw an estimate that the inflow of funds from relatives to support families in Nicaragua was something over \$300 million, which is I think about the same as total Soviet aid. So the Nicaraguan economy survives, in a sense, because of Nicaraguan relatives in the U.S. and the Soviet government and a few other governments in the East. And they're about equal in terms of overall significance. One goes to the state, and the other goes to individuals.

But it's crucial to survival, and a lot of families have the deliberate strategy of sending the most likely member to the U.S. to earn money and send it back. A member of the family is chosen to go, and their duty is to send money back, as much as they possibly could. It means that families in Nicaragua can survive, but it has the further consequence that the people who are most likely to be able to earn money in the U.S. are probably, in an objective sense, the most skilled people. So the survival strategy is also a brain drain strategy. It's a brain drain decided at that end, but conditions which dictate it are created at this end.

SfN: What's happening with Western European aid?

R.S. It's very small in aggregate terms, compared to what they get from the Soviet Union. It's there and makes a good contribution, directly toward particular projects. The real role of Western Europe in the Nicaraguan economy is that it takes Nicaraguan exports, as a substitute for the United States. Western Europe is

now the biggest market for Nicaraguan primary product exports, and it's important in that sense that the Western Europeans haven't followed the U.S. in implementing the embargo. But it doesn't supply many of the imports: the imports come from the East, and the exports go to the West.

Most of what they get from the East is on credit. Petroleum for example. If they had to pay for it, it would be a total catastrophe. That's part of the aid, the credit which allows them to get petroleum. Petroleum imports last year were just a little bit less than the total value of all exports. So if they'd had to pay for it, you could say that all of the export earnings would have been used to pay for just one commodity.

SfN: How do Nicaraguan economists see the country developing, in the long term, and what is the role of the university in this?

R.S. Nearly all Nicaraguan economists at present are obsessed with short term problems, like questions of food supply, how to pay wages when the government doesn't actually have enough cordoba bills. But they dream of the days when once again they will be able to start thinking about long-term development problems. Number one is the desire to reduce Nicaragua's dependency on the outside. It's a bit ironic to look at a program of outside assistance in that context, but obviously you cannot reduce dependence on the outside without changing its nature. That's where voluntary organizations such as SftP become very important. One of the aspects of dependency is exporting primary products to foreign markets as being their only source of income, and that can be changed in the very very long term by changing the productive structure, which is very hard to do. It's hard to say that a particular program can contribute to that, although in some cases it can, because more scientific knowledge, more technicians, will enable a country to transform its productive structure more readily. So in that sense, you can say technical and scientific assistance is related to a long-term development strategy.

I found an interesting tendency to think of technical and scientific development in a slightly different way than is often done in third world countries. People aren't thinking in terms of grandiose high-technology as a route to development. There's more interest in the adaptation of technologies and specifically in the appropriate technology movement. I wouldn't say that's a generalized view, but I've found a fair amount of interest in those kinds of views, including at high levels. There's a strong view that they want their development to be different, sociopolitically, from that of other countries. They don't want to have an isolated super high-tech sector of the economy and the rest very backward. They want to find some way to use science and technology to spread the benefits more generally and therefore to look for applications in things like peasant agriculture, rather than just look to superindustrialization as a strategy of development.

Partly though, they're using new technologies to preserve old social institutions like the peasantry—a cooperative peasantry, but nonetheless a peasantry. Whether this is the way the world will work out I don't know, because at the moment a lot of the peasantry is migrating into the cities and is becoming part of the informal sector. So the economic situation is also destroying the peasantry to some extent. Healthy development in Nicaragua will involve a great deal of decentralization. Over a third of the population lives in Managua, which is an overtaxed city in every way; two-thirds of the population lives in just a small belt along the Pacific. The trouble is, at the moment Nicaraguan planners don't have the objective situation in which they can implement decentralization because they would need to invest in rural areas and they don't have the money. So that's a long-term strategy again. But at some stage they will have to think about dismantling the excessive centralization which has gone on over ten years

just as a response to crisis.

If you want to restore a peasantry, but one which is more efficient and prosperous, that means using creative science and technology in agriculture, and also applied to the other things which you would need in rural development, like hydraulics, water supply, medicine. Then there are areas which just stare you in the face in Nicaragua, like environmental problems, which require some kind of creative scientific technological approach to master them. The fact that Lake Managua is dead, it's a source of poison, whereas it could be a basis of economic development. And soil erosion. And they think those problems are more important than having the latest kind of steel mill.

SfN: How is it anticipated that the experts trained in the universities can participate in development and to what extent is this happening?

In Nicaragua at the moment, the economy has suffered so much in the last twenty years from earthquake, war, civil war, imperialist attack, etc., that the most important thing to do is reconstruction. Getting people to reuse skills that they have already used in the past, getting the economy to do things that it was doing twenty years ago, but which it's ceased to do. A lot of the skills are already there, but they're being wasted. I met a doctor who had given up working in the hospital because he could earn more money selling fruit and vegetables in the *Mercado Oriental*. There is somebody who has been trained in the universities, in Nicaragua and then probably here in the U.S., whose training is completely useless in the present situation. So there's a sense in which training professionals is not the key issue, but the key issue is somehow to restore an economic structure in which it becomes rational for professionals, people who are trained, university graduates, to do useful productive work.

SfN: You said the need for them is to reconstruct, rather than train professionals, but who's going to reconstruct?

R.S. There's a very difficult context in which the training of professionals is happening. Clearly it would be desirable to get that doctor back from the *Mercado Oriental* into the hospital, working as a doctor, and to get a lot of people back from where they are now in the U.S. to Nicaragua with useful jobs where they could work as professionals, including as university teachers.

The main part of the answer is that, if that can be done, that implies that there's a context in which you can start thinking about long-term development. Then clearly, the importance of training professionals who've never existed in the country before becomes crucial. So in a sense you can say Nicaragua lacks trained personnel at the moment. It's not really part of the short term problem. I don't think that if you had lots more trained economists, you'd be able to solve the short-term economic problems in Nicaragua. The problem is not one of organization and knowledge. It's an objective social and political problem.

No economist, however clever, will be able to tell you how to resolve the contradictions I spoke of before. They can only be resolved by ending the war, and perhaps by being able to reduce military expenditure, and then by being able to control the inflation. And then, I think, a number of technical problems start emerging that professionals can really assist with.

The other part of it is that it doesn't seem to me that professionals as such have the answers to problems, but professionals within a context of political democracy and self-management, where professionals are answerable to other people. I think there's a real spirit of trying to create that in Nicaragua. Then professionals really come into their own.

Part II of the interview, dealing with Robert Sutcliffe's experience teaching at UCA, will appear in the May-June issue of the Newsletter. For details on ordering, see p. 7.

Annual Review of Nicaraguan Sociology

The Institute of Human Relations at Loyola University is now publishing a new journal: the *Annual Review of Nicaraguan Sociology*, a digest of critical social thought and analysis being produced in the New Nicaragua. Published yearly, this journal seeks to make the rapidly expanding social science literature of Nicaragua available to English-speaking scholars throughout the world. Many of the articles published in the *Annual Review of Nicaraguan Sociology* are selected from *Cuadernos de Sociologia*, *Revista Nicaragüense de Ciencias Sociales*, and other independent scholarly journals that have emerged as the key voices among the developing social sciences of Nicaragua. The essential focus of the journal rests in the presentation of original research concerning such important issues as agrarian reform, the Atlantic Coast situation, religion and revolution, mixed economy, urban problems, the struggle for regional peace, and other topics at the heart of the controversies surrounding the Sandinista revolution.

Annual subscriptions in the United States and Canada are available at \$25 for individuals, \$35 for libraries and institutions. The prices for overseas subscriptions are slightly higher. To subscribe, send a check payable in U. S. dollars made out to "Institute of Human Relations" and send it to ARNS, Editors, Institute of Human Relations, Loyola University Box 12, New Orleans, LA 70118.

Positions Available in Nicaragua

The New World Agriculture Group (NWAG) seeks professors on sabbatical, graduate students looking for doctoral thesis work, or technicians looking for work in a politically progressive third world country, in the following areas:

1. Genetic improvement and seed production of soybean and sunflower.
2. Genetic improvement and seed production of sorghum (specifically for the development of a Nicaraguan open-pollinated variety and a Nicaraguan hybrid).
3. Integrated Pest Management for the León-Chinandega area.
4. Integrated Pest Management of weeds.
5. Technician for production of bacterial inoculum (mainly soybean).
6. Insect taxonomist trained in museum techniques.
7. Plant tissue culture (mainly sugar).
8. Agronomic practices in vegetable production.
9. Weed control, insect control, and soil management in paddy rice production.

For further information, contact John Vandermeer, Department of Biology, University of Michigan, Ann Arbor, MI 48109, Telephone (313) 764-1446.

Travel Programs in Central America

25 page booklet listing over 80 organizations providing study programs, delegations, work brigades, and service opportunities in Central America. Send \$3.00 to Central America Information Center, P.O. Box 50211, San Diego, CA 92105.

Hydropower Projects in Rural Nicaragua

by Rob Wilson

The non-profit, Massachusetts-based Rural Electrification Support Project (RESP), organized by area members of the Nicaragua aid group TecNICA, is currently helping plan and supply equipment for two small hydro facilities in Jinotega and Matagalpa provinces. Those projects are scheduled to be producing electricity by May. Engineers advising RESP say the prototype design they have developed is durable, easy to replicate, relatively inexpensive, and ideally suited for the small streams of Nicaragua's highlands. They hope to help site, design, and implement at least five more generating stations through the project.

"We're working with UNI (the National Engineering University), a number of Nicaraguan energy agencies, and an Italian aid group to plan the new facilities, which will be in the 5 to 10 kw range," said RESP consultant Jim Manwell. The U. Mass. Amherst engineering professor and appropriate technology specialist taught at UNI for a semester and also worked at the remote hydro sites.

Manwell belongs to TecNICA, a Berkeley-based non-profit group that has sent over 500 technically-skilled U.S. volunteers to work in Nicaragua. The Amherst chapter of the group was already providing technical and logistical aid to Nicaraguan solar, wind, and hydro power projects when U.S. engineer Ben Linder was murdered by contras last April. Linder's death sparked the group to enlarge their project and focus on hydroelectricity, Manwell explained. TecNICA members in the Boston and Worcester areas are now working with RESP.

In Nicaragua, the RESP-assisted program is headquartered at UNI. Coordinators include North American and Nicaraguan university faculty and Italian energy experts working at the school's research center. Nicaraguan energy agencies such as INE, the national electrical utility, are also involved in project implementation.

The nearly-completed hydro projects are in the communities of Las Camelias and La Fundadora. According to Charlie Welch, a Boston coordinator for RESP and a TecNICA member, the state-of-the-art controls (key components that regulate electricity) to be installed at future RESP sites were developed and tested in New Zealand, for use in remote mountains similar to those in Nicaragua. Although proven effective, the new equipment has never been used in North or South America.

Electricity generated by RESP means power for schoolhouse refrigerators and health clinics. It will also have an economic impact, providing electricity for coffee processing facilities and enabling some kinds of light manufacturing—sawmilling or metalworking, for instance—that are now impossible.

Engineers volunteering for RESP will help with the site design and construction, while volunteers here will help in planning, problem-solving, and the acquisition of equipment.

Nicaraguan university officials say the hydro projects will provide important and practical learning experiences for a new generation of Nicaraguan engineers. Students at several universities will be trained through the project, both in Managua and on site. Residents of communities near the sites will also receive training on the installations.

For more information, or to volunteer for RESP activities, both here and in Nicaragua, call Bill Obeir (413)-665-2894 or Rob Wilson (617)-491-7986.

5. Develop a plan for long-term exploitation of underground water in León-Chinandega area. There is enough data available to hypothesize three or four levels of water availability and develop plans for the exploitation of the resource under several assumptions. Such proposals could be tested by future monitoring of inputs and extractions from the water body.

Projects for Industrial Waste Management Specialist

1. Characterization and classification of industries around Lake Managua, as part of a project to restore the lake, in terms of waste management needs. This can be done by examination of the industrial process and careful budgeting (accounting for) of inputs and outputs, without absolute need for analysis of discharges. Options for management, preferably recycling, reuse, and biological neutralization, can then be examined, largely from the literature and the advisor's experience.

At present there is not treatment of wastes from dairies, tanneries, slaughterhouses, chemical plants, with wastes dumped directly into the lake, as is domestic sewage. Few data or studies, access for detailed analysis may not be easy.

2. Catalog planned industries and evaluate potential adverse environmental effects. This would go beyond waste management but would tie in with the work of the environmental impact analyst. The work would largely involve an analysis of the proposed projects' industrial processes and evaluation of the effects of wastes produced. It should include recommendations for the most environmentally benign industries and processes available, and for on-site management programs. Requires experience and knowledge of the literature, there may be some resistance because of the need, acutely felt within the government, for industrial development.

3. Develop an immediate plan of action to minimize adverse effects on Lake Managua of both existing and future (planned) industries. Field surveys and the advisor's experience would be primary. Few data or studies exist.

Projects for Environmental Impact Analyst

1. Develop plans for correction of existing environmental problems. This will require considerable analysis and field work—problems range from water contamination to soil erosion to air pollution and the various consequences of all. Some studies, mostly of soil erosion, few data. Some testing equipment necessary.

2. Develop plans for minimizing environmental impact of proposed social and economic development. Little has been done but instrumentation not needed, so this is a feasible project, based on studies from the rest of the world and the advisor's experience.

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This issue was produced by Michael Harris, Manuel Toledo-Quiñones, and Gary Keenan.

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West Coast Group Flourishes

by Robert Van Buskirk

In just one year, the Berkeley Chapter of Science for the People (SfP) has blossomed from one person who moved from Boston to a committee of over 15 people working on a wide range of projects and events. This organizing success is testimony to the continuing opposition to U.S. policy in Central America and the interest in the alternative approaches to development being taken in Nicaragua.

In the first few months, flyers and a free ad in a local newspaper brought a few people to monthly meetings, while working relationships were developed with local student, faculty and community organizations working on Central America issues. By April SfP began its first project, Books for Peace, a continuing campaign at UC Berkeley to provide material aid mostly in the form of English and Spanish language textbooks for Nicaragua's universities.

Undertaken jointly with the local committee Students Against Intervention in Central America (SAICA), Books for Peace collected a total of 1000 pounds of used textbooks from UC students last spring. Potentially useful books were sent to Nicaragua, others were sold to local used bookstores for funds. Half of the money was sent to a student organization at the National University of El Salvador, while the other half bought much needed textbooks, ink and stencils for Nicaragua's universities (see SfN Newsletter Vol. 1, No. 4 for more details). With 1000 pounds of books collected last December, Books for Peace promises to be a continuing source of books and material aid for Nicaragua's universities.

The new academic year has seen West Coast SfP undertake several new projects and develop close working relationships with campus organizations now working in solidarity with Nicaragua's universities. One such project is to expand the scope of the Science for Nicaragua program to include water resource development and the resolution of environmental problems. In October, the San Francisco solidarity group, Elders for Survival, asked West Coast SfP to take over its program in support of Nicaragua's Environmental and Water Resource Agencies (IRENA and INAA respectively). Currently, we have two people working in IRENA on a variety of environmental projects. The West Coast group is raising funds for the purchase of a four-wheel-drive vehicle that is crucial for environmental and water resource field studies, as well as recruiting people to work with IRENA and INAA.

Other projects of the West Coast group center on fundraising and educational work at local universities. On several campuses, we are circulating fundraising letters signed by local faculty. Meanwhile, at UC Berkeley (UCB), we are organizing a three-hour Read-In in March where local artists will read their poetry. Donations for the Science for Nicaragua program will be taken at the door. At Berkeley, we are also sponsoring a talk by Luz Maria Sequeira, the head of the Department of Psychology at the Central American University in Nicaragua. She will speak on "The Revolution in University Education."

The interest in Nicaraguan higher education has led to the formation of several groups working in solidarity with Nicaraguan universities. At UCB SfP has become an official student group and joined in a coalition with two other groups, the Central America Committee of the Graduate Student Assembly and the Coalition for Social Justice in Public Health to work on several joint projects: 1) admission and support of several Nicaraguans to study at the university, 2) material aid for institutions of higher learning in Nicaragua, and 3) organization of a university to university delegation in August where faculty, students and staff will meet their Nicaraguan counterparts. Two of these projects (1 and 3) will catalyze further aid and cooperation through direct contact between Nicaraguan and U.S. members of the academic community.

In tapping a small part of the general interest in Nicaragua, the Berkeley Chapter of SfP has begun what we hope is the first wave in a continuous stream of events and activities in cooperation with and support of the Nicaraguan approach to higher education.

Robert Van Buskirk is a graduate student in Physics at Berkeley, and a founding member of SfN.

Puerto Rico Committee Organizing Nica Tour

CONIPCIT, our rapidly growing Puerto Rican chapter, is making plans for a late July tour of Nicaraguan universities, reports SfN founding member Víctor López-Tosado. The Puerto Rican committee, which now consists of about 15 people affiliated with the University of the East Coast, is also actively collecting Spanish-language textbooks, and selecting videos and films for the educational technology project supported by New England Biolabs (see reports in *SfN Newsletter*, Vol. 1, No. 3; Vol. 2, No. 1).

For further information on the tour or on other CONIPCIT activities, please contact CONIPCIT at the address on p. 7.

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