to represent a considerable handicap. In addition, some scientists who are especially worried about the health effects of plutonium question the registry's heavy emphasis on long-term epidemiology. Among them is Donald P. Geesaman, a biophysicist at the University of Minnesota's School of Public Affairs.

"If all they're looking at is body burdens and the cause of death, this may be next to useless," Geesaman says. "God only knows what else plutonium workers are exposed to—tritium, other radionuclides, hydrocarbons you never dreamed of. For meaningful results you have to look on a fine scale for pathology near local depositions in tissues."

Norwood replies that a few close examinations of autopsied bone have been done, but that techniques need refinement and uncommonly large depositions are necessary now.

In large measure the Transuranium Registry's sensitivity as an early warning system depends upon the nature of the effects, if any, to be discovered. The appearance of a rare malignancy—a bone sarcoma, for example—among the first few dozen autopsies would be a clear signal that something was amiss. But hundreds of deaths among the registry's enrollees might be required to detect a statistical increase in garden variety lung cancer.

In the meantime, there is a growing urgency to the central question: Are current occupational standards for plutonium, set in 1949, still adequate? As the nation moves toward the commercialization of plutonium, the standards have become an issue between environmentalists on one side and the proponents of nuclear power and the radiation standards community on the other. Earlier this year, for instance, the Natural Resources Defense Council, a respected environmental law group, contended in a lengthy technical paper that current exposure limits for airborne plutonium were too high by a factor of at least 100,000. Others, like Karl Z. Morgan, an eminent health physicist at the Georgia Institute of Technology, believe that a solid biological case exists for reducing the present maximum permissible body burden of plutonium by a factor of 40 or 50. This limit is now set at 40 nanocuries, an amount of material about equal to a pencil-point dot on a piece of paper.

Many health physicists, however, believe that no change in the standards, or only a small one, is warranted. Frequently cited as a reason for reassurance is the lack of apparent effects in a group of 25 GI's who were heavily contaminated by plutonium during the Manhattan Project and who have been monitored carefully ever since by researchers at Los Alamos. Chester Richmond, for many years a leader in plutonium effects work at Los Alamos, notes that the only signs of pathology in these men so far are "metaplastic changes found in the sputum" of some of the men. Such changes, though a possible precursor of malignancy, are not uncommon in middle-aged men who smoke.

Even though their number is small, Richmond continues, "I feel very reassured that our standards are not way out of line as some have suggested. If they were—by orders of magnitude—you would have seen something in this group, perhaps a bone sarcoma. They would have raised a red flag."

Walter S. Snyder, a member of the internal exposure committee of the International Commission on Radiological Protection, the leading standards organization, is similarly sanguine but cautious. No adverse effects have been seen thus far, he notes, but if there was one lesson learned from the radium workers a half century ago it is that radiation-caused malignancies may take decades to manifest themselves.

"We are still on edge about this," Snyder says of plutonium. "We're playing a game with very little human data."

—ROBERT GILLETTE

Erratum: In the first of this two-part series on 20 September the Nuclear Materials and Equipment Corporation was incorrectly identified as the Nuclear Materials and Engineering Corp.

UN Conferences: Topping Any Agenda Is the Question of Development

The World Population Conference ended on 30 August in Bucharest without producing explicit agreement that there was a world population problem, and the United Nations Law of the Sea Conference in Caracas wound up a day earlier without doing any legislating. What both the UN-sponsored meetings did contribute was sharper definition of the division between the developing countries and the Western industrialized countries, particularly the United States. Does this mean that the conferences were failures—perhaps that the world conference is likelier to produce confrontation than cooperation? Or does it simply mean that the problems addressed at Bucharest and Caracas are of such magnitude and complexity that it is naive to expect instant results?

The question is a fair one since the world conference form is very much in vogue. A cycle that began with the Conference on the Human Environment in Stockholm in 1972 accelerated with this summer's meetings, and will continue with a World Food Conference from 5–16 November in Rome, an International Women's Year Conference in Bogotá next summer, and a World Conference on Human Settlements in Vancouver in 1976.

The UN Conference on the Law of the Sea, which is the third of its kind, was, in effect, recessed, and is scheduled to resume in Geneva from 17 March to 3 April next year and, with good luck, to conclude with a treaty-signing session back in Venezuela next summer. Not all world conferences are the same, of course. The Law of the Sea Conference differs significantly in aim and in dynamics from the population and food conferences, for example. Its object is a major revision of maritime law, with the stormiest issues involving territorial limits, fishing rights, and the exploitation of minerals beneath the seas. The conferences on environment, population, and food do not focus on specific questions of international law but, to make progress, require the accommodation of social and cultural differences as well as the reconciliation of conflicting economic and political interests. The issues under discussion can all be viewed as different aspects of the problems of underdevelopment.

A familiar phenomenon at the conferences has been the bitter, often ritualistic criticism of the United States by the developing countries and socialist

countries. Being on the receiving end in an adversary relationship is, of course, nothing new for the United States. The world conferences simply provide another platform for the rhetoric of the bloc politics which has evolved in the United Nations in recent years.

The basic schism dates from the beginning of the Cold War, which produced the division between the Western industrialized countries and the socialist countries led, respectively, by the two superpowers, the United States and the Soviet Union. A group of "neutralist" or "nonaligned" countries coalesced into a bloc in the 1950's and, as the process of decolonization produced a growing number of small, generally poor countries, this bloc grew into a loosely allied coalition of developing nations known in the UN as the Group of 77 and generally as the Third World.

Over the past two decades this bloc's main thrust has shifted from simple anticolonialism to a more sophisticated campaign against what they see as economic and political exploitation by the industrialized West. The Western nations are charged with buying raw materials cheap from developing countries and selling manufactured goods dear, thus putting developing countries permanently in the role of debtors and dependents. By this analysis, the West has maintained its advantage by controlling world markets, particularly by manipulating the international monetary system and investment institutions.

The series of so-called UNCTAD (UN Conference on Trade and Development) meetings over the past decade appears to have been the seedbed of this analysis and the rhetoric accompanying it. But it was the oil price increases of last winter and the inflationary surge that resulted which caused some significant changes in both relationships and rhetoric. It was, in fact, at a special session of the UN General Assembly "on problems of raw materials and development" called on the initiative of President Boumedienne of Algeria last spring that the dialogue on development acquired its present form.

What the developing countries envision and are demanding is dubbed a "new international economic order." Although no comprehensive blueprint is provided, the new order would include higher prices for raw materials, greater control over multinational corporations by countries where they operate, and changes in the terms of trade, aid, and investment to benefit developing countries. In general they are demanding a fairer sharing of resources which they insist are now consumed in excessive quantities by the United States and other Western nations. The ideas themselves are not new but the context in which they are advanced has changed. Since the oil price increases of last year, the old groupings into industrial and developing nations, into haves and have-nots, has become less clear. Among Western nations, the United States, with its potential for developing new energy resources and capacity for producing food for export, is perhaps least affected. West Germany and perhaps Japan, because of their powerful economies, seem likely to weather inflation and the pressures on balance of payments caused by oil costs. But for most Western European nations, particularly Italy and Britain, the added costs of energy may seriously undercut economic viability.

The "Fourth World"

In the Third World, the major oil-producing countries have risen to a new level of affluence and influence and a few other developing countries having large supplies of scarce raw materials entertain hopes of similar prosperity. But ironically, it is the poorest of the developing countries, often those with the largest populations, whose positions have deteriorated most seriously. Countries like India, which perhaps need costly fuel and fertilizer most, are now least able to afford it. A new stratification among the developing countries has occurred with the poorest countries forming what Barbara Ward and others now call the "Fourth World."

At Bucharest it was Bangladesh—generally acknowledged to be an economic basket case—which was the source of talk about a principle of free immigration from countries with insupportable excess population, a proposal with which countries on neither side of the population issue appeared prepared to deal.

This proposal was more extreme than most but it is not surprising that the discussion at Bucharest was not limited to the pros and cons of birth control. It was the first big population conference at which governments were formally represented (*Science*, 1 March) and was therefore inevitably a "political" conference, where resolutions such as those condemning apartheid and calling on Portugal to accelerate the granting of independence to its African colonies were to be expected.

Equally predictable was the developing countries' insistence that the conference emphasis be shifted from population control to economic and social development. A 10,000-word Plan of Action adopted at the end of the meeting falls far short of the world population policy that some optimists hoped for. The primacy of national option and stress on development insisted on by the majority is reflected in the preamble to the recommendations for action.

> Countries which consider that their present or expected rates of population growth hamper their goals of promoting human welfare are invited, if they have not yet done so, to consider adopting population policies, within the framework of socio-economic development, which are consistent with basic human rights and national goals and values.
>
> Countries which aim at achieving moderate or low population growth should try to achieve it through a low level of birth and death rates.
>
> Recognizing that per capita use of world resources is much higher in the more developed than in the developing countries, the developed countries are urged to adopt appropriate policies in population, consumption and investment, bearing in mind the need for fundamental improvement in international equity.

Resistance to any general pronouncement in favor of population control came from a mixed coalition which observers at Bucharest say was led by Argentina, which took a pronatalist line, apparently on dogmatic Peronist grounds. The main backers were African states, many of which have high birth rates but also high infant mortality and argue that proper use of the continent's agricultural and mineral resources would support a much higher population. A background role was played by the representative of the Holy See, which flatly rejects contraception, abortion, and sterilization.

The Soviet Union took the line that capitalism rather than population is the root of the developing nations' problems but is said to have maintained a rather low profile at the meeting. China, on the other hand, was an energetic critic of the capitalists and exponent of the development-first viewpoint. There would seem to be some conflict between Chinese theory and practice since the country is thought to operate a strong family planning program and apparently refused to permit a UN report on the program to be distributed at Bucharest.

Asian countries such as India and Indonesia proved to be the strongest proponents of population control programs though at the same time emphasizing the need for development.

The United States would obviously

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have welcomed the promise of more action than was contained in the Plan of Action, but the U.S. delegation seems to have been relieved that the final form of the plan was close to a "fall-back" formula worked out by the UN secretariat.

A conference like the one at Bucharest should probably not be judged by the floor debate and the final report it produces, as the press often tends to do. But it is difficult to know how far to credit more sanguine estimates from conference participants who sometimes incline to professional Pollyannaism.

UN conferences undoubtedly have consciousness-raising value. Preparations include a round of regional seminars and the writing and circulation of new technical papers, some of high quality. Contacts made among people from inside and outside government in the process have long-term effects which are hard to assess. There is also an outpouring of information and, what in some cases is more important, attention is directed to gaps in information as, for example, the lack of reliable census figures for some countries.

World conferences are now organized with plenary sessions—at which rhetoric is vented—balanced by smaller meetings of experts where interactions are often useful. In addition, starting with Stockholm, the interested but uncredentialed have had access to an unofficial parallel meeting which at Bucharest was called the "Tribune." These sessions are uneven in quality and are viewed by some as providing the UN organizers with a safety valve, but some of them, interestingly enough, draw delegates away from the main conference.

One of the more striking and potentially significant developments at Bucharest was the injection of women's rights into the debate and, rather prominently, into the Plan of Action. Highly capable women have been active in the family planning movement for many years. What was noticeable at Bucharest, however, was the new willingness of women from Third World countries to take firm, independent lines which were often opposed to the attitudes expressed by men in their delegations. In the Plan of Action, full involvement of women in development efforts as well as population programs was urged. Translating words into action back home will not be easy, but some observers feel that pessimists on population have been underestimating the power of women.

Secretary of State Henry Kissinger last spring called the current round of conferences "an unprecedented agenda of global consultation." It is an agenda for which the United States is not notably well prepared.

Under Kissinger, American foreign policy has been primarily a "great powers" policy. But a new kind of balance of power equation appears to have developed. Third World countries remain militarily inferior to Western and socialist countries, but the developing countries appear to be protected from big-power aggression by the strategic standoff between the East and West. And Third World countries' control of oil and other resources give them increasing economic and political leverage.

U.S. relations with developing countries were badly strained by the Vietnam war and, since that period of stress, the size and motives of the U.S. Agency for International Development (AID) program have been questioned increasingly by critics in this country and abroad. Partly as a result, the assumptions that have governed the AID program have been undergoing reexamination.

For example, a study* done in preparation for the Bucharest conference by a group of anthropologists under an AID contract with the AAAS Office of International Science takes issue with the "theory of demographic transition," which has been a basic premise of development theory. The assumption has been that industrialization and urbanization in developing countries will result directly in lowered fertility rates. The study points to evidence that there are important exceptions. The point is that the AID program has been operated for nearly three decades without an adequate grasp of cause and effect in development and population matters.

All of this might have merely meant a continuing awkwardness for Americans in the delegate lounges at world conferences if the coincidence of the oil price push and two bad crop years had not made it finally clear that there is a world system in which supply threatens to fall seriously behind demand. This fact was not faced squarely at Bucharest, but, with a little bad luck and bad weather, both sides in the dispute about which should come first—population control or global social justice—may find it is later even than they think.—JOHN WALSH

* *Culture and Population Change* (AAAS, Washington, D.C., 1974).