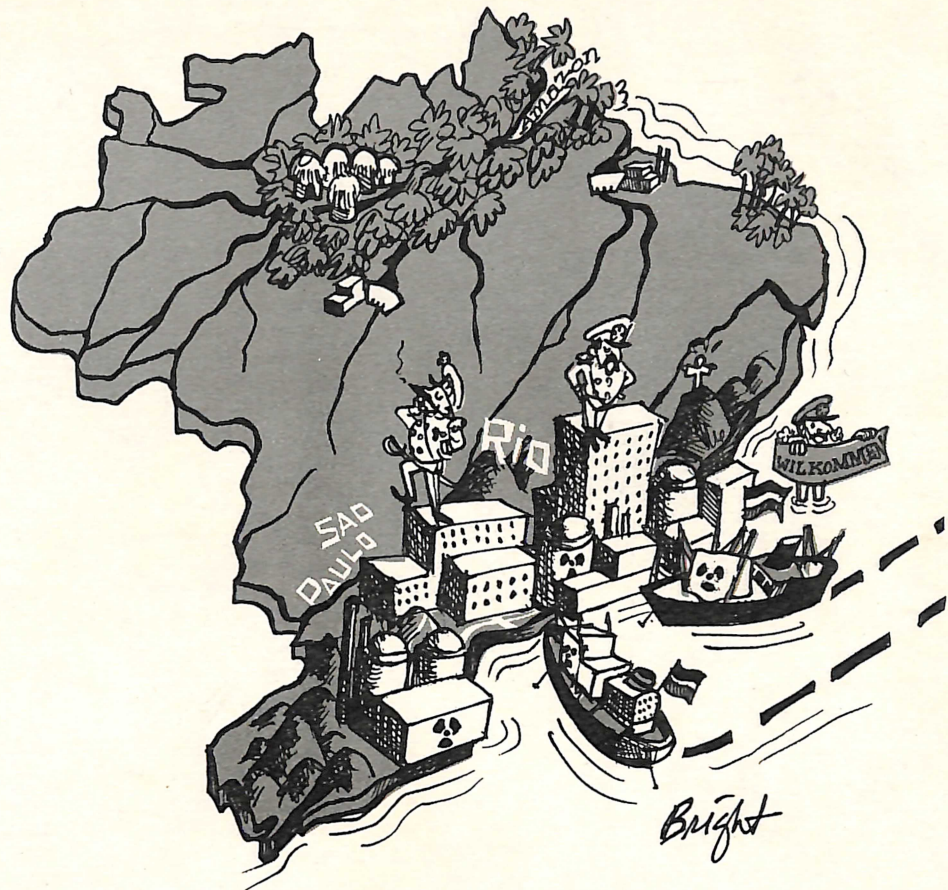


Brazilian scientists  
enter the debate



# Atoms in the developing nations

**Editor's Note:** Professor Leite Lopes is a distinguished Brazilian nuclear physicist now in exile and working at the University Louis Pasteur of Strassbourg, France. He was formerly professor of theoretical physics at Federal University of Rio de Janeiro and scientific director of the Brazilian Center for Research in Physics, positions from which he was dismissed by the military government of Brazil in 1969.

This article exhibits an ambivalence common among Latin American scholars. Being unable to decide which is the greater evil—Yankee imperialism or the military dictatorships with which their countries are currently afflicted—they tend to lump the two evils together. It's a view that is especially difficult to maintain in the case of the subject under discussion: the virtues or dangers of U.S. opposition to the acquisition by Brazil of a nuclear weapons capability via the "peaceful" nuclear energy route.—B. T. F.

J. Leite Lopes

In an article entitled "Nuclear Energy for the Third World," published in the *Bulletin* last June, a distinguished German physicist stated his perception of the economic justifications for the sale of nuclear energy plants to the developing countries by European firms and governments. According to the author, Klaus Gottstein:

Large amounts of capital have been invested in the construction of nuclear power stations by nuclear industries in the industrially developed countries. For this capital expenditure to be amortized a minimum number of reactor units must

nations of Latin America makes atomic weapons are not the other ones going to imitate it? If military officers, political leaders and some scientists in the Third World are fascinated by the "prestige" of countries belonging to the nuclear club, do they not realize that the efforts and the huge expense of such a project do not change the living conditions of the peoples of their countries?

What is the meaning of independence of plutonium production if the whole economy of a country is fully integrated in a dependence mechanism? Wouldn't the manufacture of atomic weapons by these countries be only a political device in the hands of certain military and political elites?

The following document was approved by acclamation by the General Assembly of the Brazilian Physical Society and the Brazilian Society for the Progress of Science on July 14, 1975.<sup>9</sup>

Concerning the nuclear policy of Brazil, the great majority of physicists of this country have systematically declared to be in favor of the promotion of a development of its scientific and technical human resources in such a way as to preserve the national technological independence and utilize the technical means most adequate to our stage of economic and social development.

From the official documents published by the press concerning the nuclear contracts between Brazil and Germany it would be possible to deduce a convergence of opinion between the authorities and the Brazilian physicists.

However, the Brazil-Germany nuclear agreements for the implantation of PWR reactors and of techniques of uranium enrichment in Brazil gives still rise, up to the point in which it is known, to serious

The author presented these comments to the 27th Pugwash Conference on Science and World Affairs, held August 24-29, 1977, in Munich, Federal Republic of Germany.

preoccupations as to its development.

There would be the risk of repetition of certain experiments in other domains of the Brazilian economy in which foreign technology was imported without bringing any significant advantage to the national technology.

In order that this contract, which involves so huge resources, corresponds to the expectations of a national technological independence, the Brazilian Physical Society calls attention to the following fundamental points:

- The participation of Brazilian scientists and technicians in the formulation of the methods and systems to be utilized and in the global political debate on the energy options of this country is indispensable for the technological and scientific development of this country.

- In order to educate the specialized personnel in quantity and quality compatible with a national nuclear policy, the participation of the Brazilian universities is indispensable as well as the integration of the nuclear research institutes in the university sector.

- It is necessary that the energy problem be analyzed in a global way and that the development of power reactors be accompanied by research on other forms of energy; in particular, we express reservations on the fact that in a country where 100,000-megawatts of hydroelectric potential exist it is necessary to appeal immediately to a nuclear solution of this magnitude.

- The Brazilian Physical Society reiterates its position contrary to the utilization of nuclear technology for military purposes.

- The control of the action on the environment (thermal and radioactive pollution), during and after the implementation of the project must be trusted to a suitable and independent organization like the Brazilian Society for the Progress of Science (SBPC), as it is done in countries which have advanced nuclear programs.

- The Brazilian Physical Society manifests its opinion in favor of a policy of strict state monopoly on the natural resources of energetic significance.

- The condition for any one of these points to be duly taken into account, and for the participation of the Brazilian scien-

tists and technicians in this debate, is open and free discussion on the terms of the nuclear contract and their implications in the different technological, ecological and social aspects of life in Brazil.

Statesmen who condemn independent atomic energy projects in countries where they stimulate and support military regimes of force are not consistent in their humanitarian feelings and corresponding political gestures. We are in favor of nuclear energy developments—if feasible, safe and necessary—by nations which adopt democratic forms of government where fundamental decisions by authorities can and may be freely discussed and possibly changed. We are opposed to military dictatorial regimes, which practice open or disguised forms of violation of human rights. And, therefore, we are against such regimes disposing of "Greek fire, napalm, nuclear or neutron warheads"<sup>10</sup> to be possibly employed against their own or other peoples.

#### Notes

1. See *International Bibliography on Atomic Energy*, vol. II (New York: the United Nations, 1951); Lopes, A. *Fisica Nuclear no Brasil in Ciencia e Libertacao* (Rio de Janeiro: Editora Paz e Terra, 1969).

2. For bylaws of Brazilian National Research Council, see Lopes, *Science and Development* (Rio de Janeiro: Tempo Brasileiro Edicoes, 1964).

3. T. E. Skidmore, *Politics In Brazil, 1930-1964: An Experiment in Democracy* (New York: Oxford University Press, 1967).

4. O. Janni, *Crisis in Brazil* (New York: Columbia University Press, 1970), p. 147; and H. Steiner and M. D. Trubek, "Brazil—All Power to the Generals," *Foreign Affairs*, 49 (1971) 464.

5. *U.S. Policies and Programs in Brazil* (Washington: GPO, 1971).

6. F. Bandeira, "Brazil: Subverting the Universities," *New Republic*, Nov. 8, 1969, p. 17; Lopes, "Political Obstacles to Science Development in Latin America," *Proceedings of 22nd Pugwash Conference*, Oxford, 1972; H. Neira, *Guerre totale contre les Elites en Amerique Latine*, *Le Monde Diplomatique* (Jan. 1977), pp. 2-3.

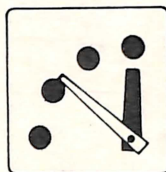
7. Amnesty International, *Report on Allegations of Torture in Brazil* (London: AI). See also, n. 6; *The Guardian*, Sept. 6, 1972, p. 4; "Beautiful Rio," *New York Review*, Dec. 30, 1971.

8. *Folha de Sao Paulo*, June 28, 1975.

9. Sociedade Brasileira de Fisica, *Boletim Informativo* (Sao Paulo), no. 3, ano. 6 (Sept. 1975).

10. C. L. Sulzberger, "Greek Fire or Neutron Bomb?" *International Herald Tribune* (Paris), Aug. 20-21, 1977.

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