The United States, however, has not been successful in its role as the world's policeman. The "world moralist" role which Carter wants to give the country is even less serviceable. He is not the first one to claim that "America's historic mission" entitles the United States to preach to the world. Over 50 years ago the following statement could be read in the American press:

"We are the world's greatest nation. Our government is the best.... As a population, we are the most intelligent, politically we are the most free, and socially the most progressive.... Our history is an epic of the triumph of justice in this nation.... We have been called upon by God to use our example in order to purify and save the world."

If this reminds the reader of Carter's statements, he is mistaken. This is the statement of the Ku Klux Klan, printed in the American Journal of Sociology in January, 1925, and in truth the current President has nothing in common with this organization, except the invocation of the United States' "historic mission."

But one thing is beyond question: neither the past nor the present of the United States in fact gives its President the right to assume the role of "the world's moralist."

How Soviets Achieved A Fusion Sputnik:

'The Strategy Of Scientific Search'

The Soviet trade union daily Trud *published the article, "The Strategy of Scientific Search," excerpted below, by Nobel laureate and leading fusion physicist Academician A.M. Prokhorov on April 28. The editors of* Trud *introduce Prokhorov as follows:*

Leading Soviet physicist Aleksandr Mikhailovich Prokhorov is one of the originators of quantum electronics, for which he and Academician N.G. Basov were awarded the Lenin and Nobel prizes. Academician Prokhorov's path to science was not an easy one. He did not finish his graduate work at the P.N. Lebedev Physics Institute (FIAN), but went to the front (in World War II - ed.), where he was a scout. A.M. Prokhorov has remained a "scout" — in science. He created new types of lasers, which are used today in the most diverse fields: medicine, energy, metallurgy, chemistry.

Besides very intensive work at the FIAN, A.M. Prokhorov is an academician, secretary of the section of general physics and astronomy of the Academy of Sciences of the USSR, and the chief editor of the Great Soviet Encyclopedia.

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Not infrequently a scientist, talking about his work, is asked: "But what does it do?" This question — and its forms are quite diverse — can be heard not only during popular scientific lectures, but also from representatives of industry and planning organizations, and its meaning is always the same: what practical use can be anticipated from a given scientific work?

This question is perfectly natural, since significant resources are expended for the development of scientific investigations. This, however, is often taken to mean that direct usefulness is practically the sole criterion of the value of any scientific research work.

Such an approach, of course, curtails the role of science in the development of human society. Of course research aimed at achieving important practical results should be recognized as timely, useful and worthy of support. But is the inverse also true? Does this mean that any research is useless if it does not bring a tangible practical result and if such a result is not even evident in the foreseeable future? . . .

Speaking of basic science, it should be recalled that this is an inalienable component part of the scientific-technological revolution in our country. . . .

Acceleration of the development of atomic energy in our country is anticipated in accord with the resolutions of the XXV Congress of the Communist Party of the Soviet Union. . . . Where did this presently most important branch of the national economy have its beginning? Its inception was directly connected with research in nuclear physics conducted during the '30s of our century.

During the 1920s and 1930s various major scientific discoveries were made in this field, which fundamentally influenced our conception of the structure of matter. From the strictly practical point of view, the purely scientific results at that time were completely "useless." At the time, when discussions arose on the possibility of achieving nuclear energy, one noted scientist in the field of nuclear physics even stated: "The energy released from the splitting of the atom is exceedingly slight. Anyone who hopes that these transformations can become a source of energy is preaching nonsense." And only in 1939 did the possibility emerge of using the achievements of nuclear physics for the goal of energy production. . . .

There are two types of research work: basic and applied, and their effectiveness must be evaluated differently. Research is considered basic if it is directed towards elucidating the lawfulness existing in nature, and the main result here is new knowledge. And knowledge then is the foundation upon which are built both further scientific investigations and applied research, which has as its goal the use of known lawfulnesses in the practical activity of man. Therefore the criterion of practicality truly is the main one, but only in the evaluation of the results of applied research. In basic research however, strict planning is senseless, since the scientific discovery always appears unexpectedly, as a qualitative leap arising from the long accumulation of knowledge. And every discovery fundamentally affects not only the course of research work, but frequently also the activity of branches of industry.

The example of quantum electronics, which arose twenty years ago, is extremely instructive in this regard. Its genesis was preceded by basic research on the radiospectroscopy of gases, which in turn was made possible

thanks to the rapid growth of radiolocational technology, which placed in the hands of physicists a powerful method for studying rotational spectra of gas molecules. This work was of great scientific interest, but again promised little from the point of view of useful application. It is no coincidence that industrial laboratories in the USA supported such research at first, but soon left off, and after this the work was concentrated solely in the universities.

In the Soviet Union, work on radiospectroscopy was conducted as basic research from the very start, at the P.N. Lebedev Physics Institute of the Academy of Sciences of the USSR. This research led to the creation of a molecular electromagnetic radiation generator — maser — the first quantum electronics device. Following the maser there appeared quantum generators of optical range — lasers. Once again discoveries revolutionizing entire technological areas arose as a result of systematic basic research. . . .

The most important scientific task today is the problem of controlled thermonuclear fusion, on whose resolution a significant number of scientists are working in many countries of the world. The achievement of controlled thermonuclear fusion reactions would open up practically inexhaustible sources of energy. And in this case too, basic research can bring success.

Basic research must be carried out on a broad front. The concentration of efforts on just one branch may give short-term successes, but in the long run it negatively affects the development of all branches of science without exception. Nevertheless one always finds impatient people hurrying to declare one scientific direction or another hopeless and unworthy of support.

I recall how during the development of quantum electronics, statements could be heard to the effect that optics as a division of physics had exhausted itself, and that therefore other directions should be developed. The creation of lasers led to a revolution in optics, and so no one says now that this branch has become outdated.

No branch of science should be shut down; it is possible and necessary to change directions in research. Arbitrary decisions in the area of basic research produce deplorable results; unfortunately examples of this exist. It is also very important to avoid an arbitrary approach in the choice of ways to solve concrete scientific tasks. For example, several means of solving the above-mentioned problem of controlled thermonuclear fusion are under investigation. It would be the grossest error to throw all our efforts into one method, ceasing work in the other directions, since no one can truly say which direction is the most promising. . . .

The economic effect of introducing scientific processes also cannot be a sufficient criterion for evaluating the activity of a scientific collective engaged in basic research. How, in reality, can we evaluate in rubles the research which led to the creation of quantum mechanics and the theory of relativity, the fundamental basis of modern scientific and technological progress?

Basic scientific research is very difficult to plan and to evaluate on the basis of any standard scale. In order to avoid mistakes which would have extremely serious negative consequences, it is necessary to conduct broad discussion of scientific problems among the scientific public. Analyzing the activity of the collective engaged in basic research, results must be looked at over a sufficiently long period of time — say, not less than 5-7 years. Attention must be given to how they have affected the development of science as a whole, the acceleration of technological progress in our country. . . .

Soviets Endorse Fast Breeder, Reprocessing

Soviet delegates to the recent International Atomic Energy Agency (IAEA) meeting in Salzburg, Austria and the nuclear suppliers' London Club meeting endorsed the development of fast breeder nuclear technology to help meet world energy needs. At the London meeting last week, according to the *Financial Times of London,* the Soviets countered the U.S. State Department's Joseph Nye with a policy document calling reprocessing and its plutonium by-product "facts of life."

In Salzburg, according to the French financial daily *Les Echos*, the Soviet representatives urged rapid development of fast breeder programs and announced that the European socialist countries will develop two new fission plants with nuclear reprocessing facilities.