

# PHYSICS and SOCIETY

## The NEWSLETTER of the FORUM on PHYSICS and SOCIETY

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### FROM THE EDITOR

Martin L. Perl, SLAC

This issue of the Newsletter of the Forum on Physics and Society, with its new title PHYSICS AND SOCIETY, represents changes in both format and content. We have gone to a self-mailing, bulk postage rate, format. We will not be able to publish as quickly, but we will save money and we will be able to publish more frequently.

The change in content is more significant. PHYSICS AND SOCIETY will continue to publish news of the Forum and of the American Physical Society. And it will continue to provide a medium for Forum members to exchange ideas. However, within its limited space, it will present articles, letters, and columns on the scientific and economic health of the physics community; on the relations of physics and the physics community to government and to society, and on the social responsibilities of science. Our space will be preferentially given to those analyses and opinions which are less likely to be published in the established journals such as Physics Today and Science. We do this because we find that it is difficult and often impossible to present to the physics community analyses and opinions which are new, unconventional, unpopular, or politically left.

Depending on costs, we may be able to publish issues with six or eight pages. However for the present, contributions must be limited to two pages; and one page is preferred. We also invited proposals for the writing of periodic columns on subjects such as the economic status of the physics community or the status of strategic weapons development. A sample column should be submitted along with the proposal.

### FROM THE CHAIRMAN

Lee Grodzins, M.I.T.

The 1970's have been years of transition for the American Physical Society; 1975 saw many changes, 1976 will see more. It is unlikely that either the issues before the Society or the methods the Society adopts to meet those issues will settle before the end of this decade.

Rick Lapidus has led us forcibly and successfully through a critical year. And he cautions that this coming year will be even more critical for FORUM as apathy succeeds success. But these coming years are particularly critical for our society, and the role of FORUM will be no less important. The Society continues to crawl towards establishing procedures and mechanisms to advise and assist physicists in their training and employment at every state of their careers. Neither the Society nor the individual parts of it, have come to grips with the major, let alone the subtle effects of stagnated resources, declining opportunities for young scientists, an aging community, and all of the problems attendant to Big Science. The country has no long range science policy and neither do we. The physics community should come to a consensus as to its own priorities and programs without waiting for a national will-o'-the-wisp. Central to our considerations should be the problems of strengthening the quality of those entering the physics profession and preserving those resources which will allow the community to maintain our long traditions of uncommon excellence. We are and we should be the FORUM for the discussion of these issues, and we too have a tradition of excellence to maintain. The FORUM's continued success requires continued involvement; I ask all of you to join with me.

## Forecasting the Energy Crisis

Barry M. Casper, Carleton College

Several recent accounts of the now-defunct President's Science Advisory Committee (PSAC) and its White House staff, the Office of Science and Technology (OST), suggest that if we had only listened to the experts, we could have anticipated the current crises and made adequate preparations. In the words of E. Skolnikoff and H. Brooks:

"For almost every crisis problem of the 1970's there is a PSAC or OST report which foresaw the problem and recommended a research program to do something about it. But in almost every case OST failed to get the attention of top policy makers sufficiently to raise the issue to the necessary level of political visibility to generate concern and action. Authoritative, scholarly reports were produced, but little else. And the subject tended to die after a little flurry of attention." <sup>1</sup>

The example most frequently cited is the energy study, "Energy R&D and National Progress," directed by Ali Bulent Cambel, submitted to OST in 1964 and published in 1966. A number of people formerly associated with PSAC have alluded to this report as an example of a prescient study which foresaw the impending crisis in energy and sounded the alarm, but whose policy recommendations were not heeded.

For example, according to Richard Nixon's Science Advisor Edward David:

"The energy situation and the need for new sources and conservation of energy were implicit in the report..." <sup>2</sup>

John Kennedy's Science Advisor Jerome Wiesner recalls:

"I remember very well the Cambel energy group which predicted almost all of the problems we are facing today...But it wasn't possible to mobilize the government." <sup>3</sup>

David Beckler, Executive Officer of OST, goes even further:

"When, in 1965, it urged action ...to bring about a better balance between nuclear and fossil fuel research before the pressure of Arab intervention, there was little or no interest or response at the top of government." <sup>4</sup>

That the report had little impact on government energy R&D priorities is attested to by the following comparison of the federal energy R&D budgets in 1963 and 1972:

	1963(%)	1972(%)
Fossil Fuel	15%	16%
Nuclear Fission	63%	67%
Nuclear Fusion	8%	10%
Solar and Geotherm.	0.9%	0.6%
Other Energy R&D	12%	7%

Why, one might ask did the government not respond? It is clearly important to answer this question if one hopes to deal more effectively with future crises. A number of plausible answers have been advanced. For example, Skolnikoff and Brooks suggest that PSAC did not do an effective selling job: "most of its reports failed to translate their analyses sufficiently for politicians to understand their significance in their own terms." <sup>5</sup> Beckler suggests it takes a crisis, not merely a warning of crisis, to bring about the public pressure that is required to make the government respond: "...the Congress and the public have a penchant for dealing with pressing rather than emerging problems." <sup>6</sup>

In fact, in the case of the energy study, there was a much more basic reason for the lack of response: The alarm was never sounded; there was no clear warning of an impending crisis. If one reads the Cambel report, one gets no sense of urgency, no hint that an energy crisis might be in the offing. It is a comprehensive discussion of the status of energy R&D, which expresses general satisfaction with the way things are going. In the space available here, it is not possible to summarize the entire report; it is somewhat eye-opening,

however, to read its perspectives on a number of concerns of the 1970's.

Did the report foresee imminent shortages, warn against increasing dependence on imported petroleum, and recommend a "Project Independence" crash program of R&D? On the contrary:

"...since no true emergency nor compelling opportunity is foreseen, the total energy R&D expenditure looks reasonable. Of course, if heavier reliance were to be placed on imported energy resources, the level of R&D expenditure should undoubtedly decrease."<sup>7</sup>

Did it anticipate the potential of alternative energy sources, such as solar and geothermal, and recommend the substantial increase in federally funded R&D that we have seen recently? Not at all. They are hardly mentioned and there is certainly no sense that they are underfunded:

"Without significant technological breakthroughs, solar energy has little prospect of extensive civilian use except in special circumstances."<sup>8</sup>

"Presently, geothermal energy supplies only a minute portion of U.S. energy requirements. Because the need to develop geothermal sources is not urgent, a large R&D program is not essential."<sup>9</sup>

Did it strongly urge a national effort to conserve energy? A "synopsis" section deals with conservation quite succinctly: "Conservation, per se, is not an economic necessity."<sup>10</sup> It then refers to a section in the body of the report where one reads, incredibly, that the real problem may be that we are not using our fossil fuels fast enough:

"The findings of this staff study indicate no grounds for serious concern that the Nation is using up any of its stocks of fossil fuels too rapidly; rather there is the suspicion that we are using them up too slowly. This

suspicion is based upon the view that present prices of fossil fuels, which are subject to regulation, are too high... Thus, rather than fearing a future day when fossil-fuel resources will be largely exhausted and the Nation will want for energy, we are concerned for the day when the value of untapped fossil-fuel resources might have tumbled because of technological advances and the Nation will regret that it did not make greater use of these stocks when they were still precious."<sup>11</sup>

(italics added.)

This is hardly a ringing cry for a dramatic change in the nation's energy policies. To say that the Cambel report foresaw "the need for new sources and conservation of energy" or "predicted almost all of the problems we are facing today" or "urged action...before the pressure of Arab intervention" is to rewrite history.

A question which merits further study is not why the government did not respond, but why this "expert" study did not foresee. I suspect the answer lies not only in the inherent difficulty in predicting future events, but also in the closed process of soliciting selected expert opinion that produced this report.

#### Notes

1. E. Skolnikoff and H. Brooks, Science, 1/10/75, p. 38.
2. Technology Review, Jan. 1974.
3. ibid.
4. D. Beckler, Daedalus, Summer, 1974, p. 125.
5. Skolnikoff and Brooks, op. cit., p. p. 38.
6. Beckler, op. cit., p. 129.
7. Cambel, A.B., et al, Energy R&D and National Progress: Findings and Conclusions, USGPO, 1966, p. 14.
8. Cambel, A.B., et al, Energy R&D and National Progress, USGPO, 1966, p. p. xxx.
9. ibid., p. xxx.
10. ibid., p. xxxvi.
11. ibid., p. 55.

Membership Drive:

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PHYSICS AND SOCIETY is also distributed free to Physics Libraries upon request. Such requests and requests for other information should be sent to M.L. Perl.

NEW FORUM OFFICERS

The results of the Forum election for terms beginning January, 1976 are:

Vice-chairman:

Benjamin Cooper, Staff Member,  
U.S. Senate Committee on Interior  
and Insular Affairs.

Forum Councillor:

Earl Callen, Physics Department  
American University.

Secretary-Treasurer:

Thomas Sheahen, Office of Energy  
Conservation, N.B.S.

Forum Executive Committee:

William Blanpied, Division of  
Public Sector Programs, A.A.A.S.  
and

John Gibbons, Environment Center,  
University of Tennessee.

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