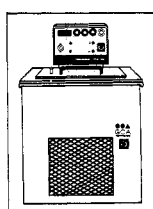


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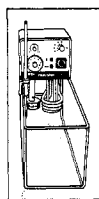
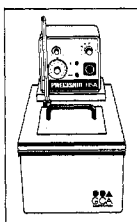
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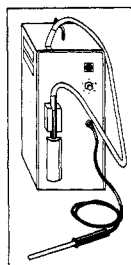
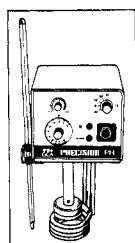
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LETTERS

Warburg Effect Revisited

Under the above title, an article was recently published in *Science* (17 July, p. 303) that I coauthored with Mark Spector, a graduate student in my laboratory. I feel compelled to withdraw some of the claims that we made in that article. On 24 July 1981, Volker Vogt, an assistant professor in our department with whom I have collaborated, discovered that the data obtained from an experiment involving immune precipitations from extracts of cells transformed with Moloney sarcoma virus were incompatible with the experimental protocol. This important discrepancy, and several others discovered with the generous help of other tumor virus laboratories, cast doubt on some of the published and unpublished claims we made. I state below which of the basic observations have been repeated by independent tests and which are doubtful.

1) I have confirmed the phosphorylation of the β subunit of the sodium, potassium-dependent adenosinetriphosphatase (Na^+, K^+ -ATPase) by a protein kinase from Ehrlich ascites tumor cells prepared by Mark Spector. I have established that the phosphorylated amino acid on the β subunit is tyrosine.

2) We mentioned in our article a 6000-dalton polypeptide isolated in my laboratory by Spector that activated the phosphorylation of one of the enzymes of the protein kinase cascade (PK_S) by another (PK_L). I have performed these experiments several times with preparations of PK_S , PK_L , and activator, supplied to me by Spector, and observed at least a three- to fivefold stimulation of protein phosphorylation in the presence of the activator. Spector also gave to George Todaro, chief of the Laboratory of Viral Carcinogenesis at the National Cancer Institute, a preparation of the activator (now shown in Todaro's laboratory to be a mixture of several small polypeptides) which was found to be active in inducing phenotypic transformation of normal cells to cells that show anchorage-independence of growth. I have also tested a preparation of a transforming growth factor given to Spector by Todaro, and I have found it to be very active in the above described system of phosphorylation with PK_S and PK_L . It is obvious that these experiments will have to be repeated with enzyme preparations and an activator of known purity. On the other hand, I have been unable to verify the effectiveness of the different preparations of rabbit antiserum which supposedly neutralize and precipitate each of

the four protein kinases. Since I know that some of these samples were shipped to other laboratories, I suggest that no further experiments be conducted with them.

I am also not certain of the correctness of some of the physical-chemical properties ascribed to the protein kinases, but I cannot state that they are wrong. We are now checking all published data, and it will take us many months before we know what is correct. We suspect that some of the data dealing with cells transformed by various tumor viruses are incorrect. We did not deal with these experiments in the *Science* article, but they were subjects of a paper in press which we are withdrawing. They were also presented by me and others in seminars, and I wish to withdraw these claims until we can verify them.

EFRAIM RACKER

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The Einstein Papers

I regret that only limited space is permitted to comment upon the long article "Waiting for the Einstein papers" (News and Comment, 17 July, p. 309). I shall, therefore, be able to mention only a few of the many misstatements and omissions in that article:

1) The article does not mention (as it is omitted in almost all statements, briefs, and publications by Princeton) that, when proposing a board of three coequal editors, the Einstein estate suggested that John Stachel be appointed one of the three, the one primarily responsible for Einstein's physics. Nor is it mentioned that the estate's suggestion resulted from the recommendation of the search committee which had nominated Stachel as an "alternate" for such a panel of editors. Finally, it is not mentioned that Herbert Bailey, the director of Princeton University Press, and arch-enemy of the estate's proposal, had himself made similar suggestions in 1974 and 1975.

2) In stating the credentials of the arbitrator, who found in favor of Princeton University Press, it is not mentioned that he is an alumnus of Princeton University, as he himself stated on the last day of the arbitration hearings.

3) John Wheeler's statement about the Soviet publication of Einstein's writings and the implications made by him are misleading. The Soviets only reproduced published papers by Einstein, all

of which are and always have been available to scholars in the United States.

4) All that is said concerning my negotiations with J. Robert Oppenheimer is incorrect and misleading.

5) The statement about the estate's alleged "arguing" about the ending of Stachel's editorship seems to imply that the estate attempted to misconstrue the arrangements made and signed by Princeton University Press, the estate, and Stachel in February 1978. This is completely incorrect. The best witness to this fact is Bailey, who under oath confirmed several times that the February arrangement "terminated" Stachel's editorial services as of 14 July 1979.

6) The article quotes verbatim, and without any proof or commentary, the following insulting statement by Nathan Reingold of the Smithsonian Institution: "Nathan has created a serious problem for open and objective use of the material. Unless that *grip* [emphasis added] is relaxed, there will be no edition on a satisfactory basis." Reingold and I have never met, nor has there ever been any communication between us. His deep insight into my betrayal of Einstein can only come from Princeton.

OTTO NATHAN

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Conservation of Tropical Forests

We wish to call attention to a global problem in which scientists, especially biologists, have a more than ordinary personal stake and at the same time are in a good position to contribute significantly to a solution.

We refer to the silent crisis of our time: species extinction. Because of the degradation of natural environments by humans, the rate of species extinction is far greater now than in any recent period in geological history and is accelerating. In the next quarter-century as many as a million species may be eliminated and countless others may be reduced to perilously low populations in degraded marginal habitats. The principal locale of this decimation is the tropical lowland forests. Of the 3 million to 10 million kinds of organisms estimated by systematists to exist, two-thirds or more are limited to the tropics; most of these are forest-dwelling, and a large percentage are found only on particular mountains, islands, riverbanks, and other strictly limited habitats.

Unfortunately, it is the species-rich

tropical forests that are also under the greatest pressure from humanity. A hundred years ago the evergreen tropical lowland forests occupied an area about twice the size of Europe. They have now been reduced to approximately the size of the continent of Europe. Each year an additional area roughly equivalent to Great Britain is clear-cut or degraded to some lesser degree that nevertheless reduces species and genetic diversity. At the same time that systematists are proceeding with the discovery and characterization of the remaining millions of species (the total cataloged to date is about 1.5 million), they are witnessing the disappearance of a large percentage of the objects of their study, mostly in tropical forests.

Species diversity is a great treasure house where riches have not yet been closely examined, much less used by humanity. Among the still largely unknown millions of species are vast potential sources of new foods and pharmaceutical and other natural products, agents of nitrogen fixation and soil reclamation, defenses against insect pests, and, not least, objects of beauty, enchantment, and wonder.

The biota of each country is no less part of its heritage than its art and history. If treated with skill and care, it can be preserved and contribute to the well-being of the nation. And this is where the responsibility and self-interest of scientists enter. The potential of the tropical biota can be realized only by scientific research. To an increasing degree biologists in particular will extend their activities into the tropics in search of phenomena for basic research but even more to assist the developing nations, whose most compelling needs are, at least in part, biological rather than military or political in nature. But it appears that when this shift begins, many of the best opportunities will have already slipped away. Extinction is indeed forever: it is possible that of all the follies being committed in our lifetime, the reduction of genetic and species diversity by the destruction of tropical habitats will be most injurious to future generations.

We therefore urge that scientists, and especially biologists, assume a greater responsibility for tropical conservation. One of the most effective roles for individuals and small groups is the identification of specific tracts of land or aquatic systems that are rich in species but imperiled by development. A pinpoint conservation movement, ranging from an expert assessment of the quality of the biota to fund raising, could prove exceptionally effective.

As a case in point, we call attention to the current effort by the Organization for Tropical Studies, Inc., a consortium of 23 universities in the United States and 3 in Costa Rica, to purchase a 1500-acre tract adjacent to its 2000-acre lowland rainforest preserve, Finca La Selva. Recently, the National Academy of Sciences-National Research Council Committee on Research Priorities in Tropical Biology selected La Selva as one of the four primary sites in the world for detailed studies of tropical ecosystems. The proposed addition, the "Vargas property," would serve as a much-needed buffer to La Selva and a site for large-scale ecosystem research. Its purchase is also expected to promote the establishment of the nearby Parque Nacional Braulio Carrillo by Costa Rica, a country whose conservation program has already been exemplary.

The Organization for Tropical Studies has an option to purchase the Vargas property for \$400,000. It has committed \$50,000 of its own funds and secured grants and pledges of \$150,000 from foundations, organizations, and individuals. The remaining \$200,000 must be raised by the end of 1982. Each of the undersigned has pledged \$1000 from his personal funds, in recognition of the special importance this effort has for future scientific work as well as conservation of the tropical biota. We hope that others will wish to make gifts, of whatever size; these may be sent to: Donald E. Stone, Executive Director, Organization for Tropical Studies, Inc., P.O. Box DM, Duke Station, Durham, North Carolina 27706.

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