substratum and then suspended, transport Ca^{2+} severalfold more rapidly than the same cells grown in fluid (Spinner) culture. When Spinner culture cells were incubated for 2 hours in complex medium containing fibronectin, Ca^{2+} uptake activity was markedly increased. We could also show that $^{45}Ca^{2+}$ became tightly bound to some components of the cytoskeleton within 30 seconds after exposure, whereas in the absence of fibronectin it took 30 minutes or longer to obtain similar $^{45}Ca^{2+}$ binding. It has been proposed (*46*) that fibronectin represents the surface counterpart for vinculin at the focal adhesion plaques [see, however (*47*)]. We can readily visualize how changes in phosphorylation of vinculin could affect the binding of fibronectin and consequently the rate of Ca^{2+} entry. There are over 30 physiological functions that are influenced by Ca^{2+} concentration in the cytoplasm (*48*) and it is not difficult to see how Ca^{2+} flux changes may influence the life of a cell.

We have related here the story of a classical biochemical approach to a biochemical problem. In the search for the cause of the high glycolytic rate of tumors we were helped by enzyme inhibitors (which were not always reliable), we had to go through the tediousness of purifying an unstable membranous enzyme from limited source material, we had to resort to reconstitution methods that could hardly be considered physiological, and we received support and ideas from virologists and geneticists who had tracked down the gene product of transformation. Above all, we have witnessed in this field a merger of biochemistry and molecular biology which was long overdue. We still do not know the significance of the high aerobic glycolysis of tumor cells. But Warburg's important discovery has led the way to a better understanding of the diversity of changes in physiological functions and morphological characteristics of cancer cells.

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Participation of Soviet Scientists in International Conferences

Edwin L. Goldwasser and Francis E. Low

For a number of years scientists from all over the world have been working toward a true internationalization of science. There have been efforts to open communications in all fields of basic research, to share data and results, to cooperate in both experimental and theoretical work. There are joint experiments involving scientists from several different countries, and a completely open exchange of ideas, as well as results, at international scientific conferences has become commonplace. However, along with the successes of international scientific cooperation there have also been some notable failures. Not all scientists have always been given free access to scientific conferences and exchanges. There was a time when one nation might limit access of scientists from another nation to meetings within its borders. The International Council of Scientific Unions (ICSU) has worked steadfastly to remove barriers of that kind and has had some notable successes.

It is relatively easy to identify restrictions imposed by one nation on access of scientists from another. It is much more complicated to identify restrictions imposed by a nation on the participation of some of its own scientists in scientific conferences abroad. This kind of restric-

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tion can prevent the most active and most knowledgeable people from presenting their data, describing their experiments, or discussing their theoretical work. If work and ideas cannot be presented by the people who are directly responsible for and involved in them, scientific exchange is inhibited. Furthermore, if one nation imposes this kind of restriction and others do not, the effectiveness as well as the symmetry of international exchange may be destroyed.

High energy physicists who are members of the Commission on Particles and Fields of International Union of Pure and Applied Physics (IUPAP) have been concerned about such an imbalance of scientific exchange for a number of years. Outstanding scientists from the USSR have been unable to attend international conferences and to give invited papers at conferences abroad. Two years ago, at a meeting of the commission in Tokyo, a resolution was passed expressing the concern of the commission about this kind of restriction and adopting a policy intended to discourage such restrictions. That policy is described below.

Two years after the enactment of that resolution, it appears that authorities in the USSR are still restricting the travel of some of their most talented scientists to high energy physics conferences abroad. The IUPAP Commission on Particles and Fields will now have to decide whether to live with and accept such restrictions, as has been the custom in the past, or to try to rectify the resulting imbalance by imposing restrictions of its own on the siting of future conferences that it sponsors. The situation is summarized in the following letter, which we recently circulated to high energy physicists in an effort to elicit a broad expression of opinion on this complicated problem. The letter is reproduced here because the same problem is also familiar to scientists in many other fields. Some scientists from those other fields have suggested that the approach adopted by particle physicists would be of interest to their colleagues in other fields.

The letter that has been circulated to high energy physicists reads as follows:

"It was a great disappointment to all participants in the XXth International Conference on High Energy Physics, held at Madison, Wisconsin, when they found that Professor L. B. Okun of the Institute for Theoretical and Experimental Physics in Moscow was unable to attend. He had been invited to present the major summary talk of the conference. He had accepted the invitation to give that talk, and until shortly before the conference he was still hoping and planning to present it. His name was included on the official USSR list of participants. We do not know why Professor Okun was unable to come. We received no advance warning that a difficulty had arisen. The conference organizers only learned of his inability to participate when he did not arrive with his USSR colleagues on the day before the conference started.

"It is difficult to divorce this most recent incident, whatever its causes may have been, from the pattern of participation by invited speakers from the USSR in conferences abroad over the past twelve years. Statistics show that for the Soviet Union, 33 physicists have been asked to participate, as invited speakers, in IUPAP-sponsored conferences abroad. However, of the 33, only 9 (27%) actually appeared at the conferences in question. In a number of the cases of the 24 who have *not* been able to appear, the invitees initially accepted their invitations to speak.

"For the rest of the world, over about the same period of time, 263 physicists were asked to contribute as invited speakers in IUPAP-sponsored conferences abroad. Of that number, 249 (95%) have appeared and made their invited contributions.

"The contrast is one that is hard to ignore. We have been informed by some of the invitees that they were not permitted to come in spite of their wish to do so. Furthermore, responsibility for the non-participation of these individuals cannot be placed on a lack of travel funds. Travel expenses for invited speakers were to be provided by the conference organizers in several of the cases in question.

"It is extremely difficult, if not impossible, to accomplish the goals of major international conferences unless contributions are normally made available, when invited, by the best scientists from all participating countries throughout the world. The scientific goals of these conferences, the IUPAP goals of international cooperation, and the organizational requirements of any large collaborative enterprise are seriously compromised if any nation attempts to reap the rewards of participation but fails to honor its commitments. In recognition of this fact, at the 1978 Tokyo meeting of the IUPAP Commission on Particles and Fields, a resolution was passed as follows:

> At all conferences sponsored by the IUPAP Commission on Particles and Fields every endeavor must be made to ensure that the best qualified scientists from all regions are able to attend.
>
> The foundation of the Commission's program of major meetings has, in the past, been a regular rotation of the venue among those regions actively engaged in high energy physics research. The principle of a parity of rotation is only meaningful if there is a corresponding parity in the participation at the conferences by scientists who are most actively engaged in the research to be discussed.
>
> The Commission's established policy must necessarily be placed in jeopardy if any nation or region is judged by the Commission not to be contributing its fair share to the scientific exchange. The Commission will not normally choose such a nation or region as the site for any conference.

"Since 1972, every conceivable avenue has been explored in an effort to persuade Soviet authorities that commitments to international scientific collaboration must be taken seriously if they wish to be treated as equals in this enterprise of scientific cooperation. It is unfortunate that our attempts to attract the attention of the relevant authorities and to support the efforts of our colleagues in the USSR to improve the quantity and quality of participation from that nation have not been successful.

"The choice of a site for the 1984 'Rochester' Conference will be made, at least in a preliminary fashion, at the summer, 1981, meeting of the IUPAP Commission on Particles and Fields. The 'normal' rotation of the sites of these conferences would place it in the USSR.

"As the two members of the Commission from the United States, we would welcome expressions of opinion or advice on this subject from members of the high energy physics community."