

Scientific  
Council

The Director General

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Extract of a Lecture by J.M. Ziman

For your information please find attached an extract of a lecture given by J.M. Ziman with an interesting comment on the Trieste Centre. It would be even nicer if the Agency were mentioned.

Attachment

cc.: Mr. Ennor  
Prof. Grinberg  
Prof. Salam

AUG 25 1969

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inadequacy of one's achievement to one's fellow scientists. In the struggle to get any work done at all, the effort to create time, funds, and organization for such meetings begins to seem not worth the possible benefits.

This is a mistake that we have long been making even in Britain, and in Europe generally. The importance of a scientific meeting does not lie solely in the formal communication of the results of research; it is an opportunity for a scientific community to become conscious of itself, and for individual scientists to become aware of one another's difficulties and common needs. Meetings cost money, and they demand public-spirited initiative from those who arrange them, but they could be the saving of many sound scholars.

The above remedies for the chronic malady of intellectual isolation attack the cause, but the disease is so deep-rooted that more drastic cures are needed. A day's visit from a travelling expert, a week at a conference, a fortnight at a summer school—these are only occasional episodes that do not really change the pattern of one's life. Somehow we must make it possible for young scientists in developing countries to maintain prolonged contact with their fellows, over periods of months and years.

The most ambitious project with this goal is Abdus Salam's International Centre for Theoretical Physics, at Trieste. This was created in 1962 as a place to which active scientists from developing countries might go from time to time, for periods ranging up to a year, to bring themselves into contact with current research and with their contemporaries from both developing and advanced nations. One might say that it was conceived as a permanent meeting place for the members of the Invisible College of this particular scientific subject, where they might return again and again to recharge their intellectual batteries. By arranging lengthy advanced courses of study, and a programme of seminars by distinguished visiting scientists, Salam has made it an institution of the very highest standing, permeated with and radiating the best scientific traditions.

The work of the Trieste Centre is so very relevant to the whole theme of this lecture that I wish I had time to say more about it. I should have liked, for example to speak of the experience of directing one of these advanced courses, which was attended by young research workers from about the most diversified list of countries that you could imagine, and which nevertheless demonstrated the complete universality of the scientific attitude in this particular field. This experience was, indeed, so moving and revealing that it is the real basis for my temerity in giving this lecture; and much of what I am saying here is merely a reflexion of their own feelings about their situation.

The International Centre for Theoretical Physics can deal only with a part of the problems on a very small sector of the whole front line of modern science. I am by no means sure that it is in all respects an ideal solution, nor that the same thing could be done in all other fields. But it has produced one entirely new social device—the scheme of *Associateships* (Salam 1966; Editorial in *Science*, 1968).

Briefly, this is a scheme by which an individual scientist acquires the means to travel to Trieste and to spend up to three months there, once a year, over a period



of several years. It is like a travelling scholarship, or post-doctoral fellowship, but broken up into small pieces, and spread over a much longer time. Travel and subsistence costs for each visit are paid for, but the associate must, for his part, continue his ordinary duties as a lecturer, professor, or scientific officer in his home country in the intervening periods.

The effectiveness of such an arrangement rests upon its being so well geared to the true needs and time scale of the isolated scientist. A few months at a time is as much as he can be spared from his official and domestic responsibilities, and yet is long enough to make significant progress on a new scientific problem. The annual repetition of this privilege over, say, 5 years, allows his work to continue and grow, with opportunities for critical evaluation each year. It stabilizes him in his native environment and yet gives him a seat at the international 'high table'. By assigning an appropriate interval of time to each of those conflicting responsibilities that tend to pull him apart, he can largely reconcile them, and serve each with honour.

But there is no reason at all why such a scheme should be arranged solely in connexion with an international centre of the Trieste type. Every good university is an international centre of learning. The cure for isolation is to come back, from time to time, to any active research centre in one's particular field. The very strength of the scientific community is that it is cross-linked in all directions, and does not depend upon just a few key 'centres'. It is still true, however, that ideas tend to flow outwards, from the most successful and active institutions (not always in advanced countries) to the isolated workers on the periphery. Let the means be found by which the latter can travel regularly to the places whence their ideas come, so that they may share a little in the making of them, and carry them home inside their own heads. The associate thus becomes, so to speak, a foreign member of an active research group, familiar as a person through his regular visits, and a party to its collective wisdom. On the scale on which money is lavished on the support of science, the cost of such a scheme would be negligible by comparison with its benefits. Here is the most practical means by which the scientists of advanced countries can give aid to their colleagues in developing countries—aid that is more precious than shiploads of books and apparatus.

As I come to the end of this lecture, I realize how much more there is to say. I am aware, too, that I have made an elementary error of scientific strategy; I have tackled an insoluble problem, and merely recapitulated all the familiar, trite, non-answers to it. But the problems of the growth of pure science in developing countries are not scientific problems, which by definition always have 'answers'. They are by no means always technological or economic problems—although these are large factors in the equations. They are historical, political, cultural, and psychological problems—that is, they belong in the realms where there are never 'solutions' but only influences. They demand more than knowledge; they demand wisdom, charity, and heroic strength. I bow to those men and women, in all quarters of the globe, who have shown by their scientific achievements under the most adverse circumstances, that these virtues are still attainable.