Letter to the Editor:

Mathematical Physics in Developing Countries

Sir,

There is only one thing wrong with Mathematical Physics as a key discipline for the creation of scientific communities in developing countries (M. Guenin, *Europhysics News,* **8** (April, 1977) 10) and that is that it gives a completely distorted view of both Mathematics and Physics! On this point the mathematicians no doubt can speak for themselves. But the impression of physics that would be given by a teacher whose research activity was solely in Mathematical Physics would be disastrously misleading. Being an honest, sincere, intelligent and enthusiastic scientist he would emphasize underlying laws of nature, formalisms, rigorous, deductions and similar features of science at the expense of empirical observation, conjectural interpretations, experimental realities and practical applications. In an advanced industrial country this does little harm, because all the trends of individual experience and social goals are away from the cultivation of abstract knowledge for its own sake. But those forces are absent in developing countries, where science students have usually had very little contact with engineering practice in their daily lives and where industry and other 'users' of the physical sciences are fragmentary and weak. The programme enunciated by Prof. Guenin is not new, has been adopted very widely and is one of the causes for the disastrous gap that is often to be seen between academic science and practical reality in many developing countries.

Fortunately, many of the younger scientists in the developing countries have realised the gravity of this error and are insisting that physics should be taught and practised as a whole science, uniting theory and experiment, fundamental knowledge and application, abstraction and harsh fact. If Prof. Guenin would care to visit the International Centre for Theoretical Physics at Trieste and discuss this matter with those of us who participate in and organise the various courses and researches that go on there, he would, I hope, repent of preaching such a misleading and outdated creed.

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Conference Reports:

EPS Study Conference

About 80 research workers from Europe, the USA and Japan participated in the EPS Study Conference on Transport Properties of Normal Metals and Alloys Below Θ_D, proposed by the Condensed Matter Division, organized by the Metal Physics Group of the University of Zagreb and held in the charming village of Cavtat on the southern riviera of the Yugoslavian coast from 9-12 May.

Some 20 contributed papers were presented (mainly ad hoc reviews) which formed the basis for detailed and animated discussions that served to correlate and summarize the existing experimental evidence and theoretical interpretations which have seen major developments in the past few years. A limited number of papers were discussed in a poster session and a certain number of interesting results were brought out in the general discussion.

The areas where the scientific interest was most concentrated and the topics which were thought likely to lead to the most promising or exciting new developments were:

The non-additivity of the resistivity induced by phonons with that induced by other scattering mechanisms. It has been shown that differences arise in combining the phonon resistivity with the resistivity induced by impurities, or dislocations or other defects.

The possibility of detecting an electron-electron scattering in simple (non-transition) metals at low temperatures. The question must be asked whether it is better to look at the thermal or at the electrical conductivity.

The status of the theoretical calculations and the relative difficulty in evaluating the various transport properties from first principles.

Are many body mass-enhancement effects visible in the thermoelectric power? Are the theoretical predictions correct?

The measurement of anisotropous relaxation times over the Fermi surface by meams of the De Haas Van Alphen effect is becoming a very detailed and powerful tool. Why, however, is the anisotropy of the electron-phonon interaction not observed?

Is phonon drag observed in the electrical resistivity at low temperatures?

Why is a linear magneto-resistance observed in high fields in potassium? is it an intrinsic effect of the metal or is it due to defects in the sample?

It was recognized during the Conference that relatively new techniques (R.F., size effect, helicon damping, cyclotron resonance) designed to observe the dynamical behaviour of electrons in metals have now reached the point where results will fit in to a more complete understanding of transport phenomena. It should also be noted that the measurement of the transport properties is now much improved by the introduction of superconducting sensors and by the availability of purer metals and easy-to-use low temperature refrigerators. This means that the range of temperatures well below O.01 Θ_D is now open to study. The limiting factor is now the availability of even purer and larger well-characterized metallic samples.

The list of topics reported above is only a resumé of the main areas where the discussion was centred. The opinion of various participants who were asked to comment on the Conference was that it succeeded in focusing very clearly the points where further theoretical and experimental research needs to be done.

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