



Collective Research in European Physics

Europe is building or planning a number of major physics tools that will occupy much of our attention and resources over the last part of this century. In Rome on March 26/27, EPS is holding a seminar, at which these projects will be presented to an invited audience of leading physicists. The following is a summary of a conversation on the trend towards centralization with Donato Palumbo of Brussels, Abdus Salam of London and Trieste, Herwig Schopper of Hamburg and Sam Ting of Boston, USA.

The traditional figure of the solitary scientist, white-coated of course, working away in a dingy laboratory, pencil in hand, surrounded by an assortment of make-shift apparatus held together by string and sealing wax, contrasts sharply with the modern image of a trained team, manipulating vast engineering complexes and feeding results directly into a computer for direct transmission to some foreign land.

Will the trend always be towards bigger and bigger machines?

A. Salam

Before considering these large collective endeavours that are necessary if we are to make progress in many fields of physics let me emphasize two points; one is that there is still room for the individual. Even teams are made up of individuals. One still needs the imagination and initiative that comes from a single person exercising his intellectual powers. The second point is that we must not identify good with big. I strongly dislike the phrase "big science" as it tends to give a false emphasis to size, and leads to the impression that high quality is associated with enormous expense and, as a corollary, modest projects and low cost activities are somehow inferior. That said let me then say how important I think these collective projects are for the future of physics. LEP, for example, is a ma-

chine that is absolutely necessary for us to push forward our theories on unification. Moreover, it would be a very great pity if such a machine were built too small so that it was not quite capable of providing the results that are looked for. There is no question either here or generally in physics of the machine builders devising something large for their own satisfaction. Again if I may quote LEP, never has there been a machine in particle physics more full of purpose since the Berkeley 6 GeV synchrotron. It is the same in other disciplines.

H. Schopper

No doubt, some disciplines, like elementary particle physics or astrophysics, need larger and larger equipment resulting in bigger research centres. However, even other parts of science which traditionally could work in very small groups become involved in "Verbundforschung" – collective research, which is centred around big installations provided by large centres. A notable example is synchrotron radiation, which is being used by research groups that typically consisted of one or two people working at small laboratories. These people now need the service of accelerators or storage rings, or if they work with neutrons they have to use big reactors. This trend is spreading to the solid state physicists, surface physicists, biologists, mineralogists and so on.

The European Great Projects

Europhysics News will be reporting on the Rome seminar in the April issue.

D. Palumbo

A distinction must of course be made between machines that are built to provide a central facility for research into fields that have no basic connexion with the machine technology, and machines that form the essential object of the research. Such is the case for the experimental thermonuclear experiments like JET; the building of the machine and its operation constitute the research objective, and size is something intrinsic. This is why talks are being held already at world level on what should happen after JET. So closely does the thinking in the various continents correspond, consideration of a global programme through the International Atomic Energy Agency is now feasible. Here it is the physics

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