

Meeting on P.S. Nuclear Physics
28.11.1957

Present: J.B.Adams, G.Bernardini, A.Citron, W.Gentner, Y.Goldschmidt-Clermont,
R.Hagedorn, B.Hedin, H.G.Hereward, M.G.N.Hine, A.Lunby, A.W.Merrison,
Ch.Peyrou, C.A.Ramm, C.Schmelzer, A.Schoch.

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Adams reviewed the present position. It is suggested to study a number of typical experiments and to investigate what they involve in beams, and apparatus. There are of course other ways to start, for example by investigating the means for bringing beams of particles to various points in the experimental hall without reference to any specific experiments. It was agreed that the first suggested course offered the best possibilities.

Adams further recommended that these investigations should be carried out with the staff already available in CERN to start with, since it would take too much time before new people could be recruited and brought up to date with the problems. This also was agreed upon, and Gentner stated the willingness of the SC Division to contribute as much as possible to the nuclear physics side of the programme.

The future working programme was then discussed. Adams emphasized that the most important purpose of the first phase of the preparations was to provide sufficient information for the design of the beams and for those improvements on the machine which were still possible. During this phase the pursuit of new ideas constitutes a certain danger in the sense that they distract the attention from the conventional problems. It is very important that the nuclear physicists spend a lot of time with the machine to get acquainted with its problems. Citron and Merrison emphasized the importance of linking the nuclear physicists and applied physicists in teams to study the problems.

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Discussing the proposed test experiments Bernardini considered that counter experiments at PS energies tend to be extremely difficult and referred to the early Berkeley work with the synchrocyclotron, which later turned out to be in error by several 100 percent because of the difficulties in the then unusual energy range. He therefore concurred with Alvarez that the weight should be put on bubble chambers, unless new techniques render counter experiments more attractive. It was decided that

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① in order to get an unbiased opinion on this question the same experiments with bubble chambers and counters should be studied.

Peyrou reported on the intensities needed for bubble chamber work. Adams emphasized that the proton-synchrotron could be put into operation about one year earlier if full intensity was not required from the start but could be attained by successive improvements of the system, separated by periods during which the machine was available for research requiring low intensity beams only. Peyrou informed that it was rather improbable that the very big bubble chamber would be ready in time for the starting up of the proton-synchrotron. He drew attention to the problem of providing a stable low intensity beam for bubble chamber operation.

During a discussion on the means for investigating the composition of the beams Peyrou suggested that a conventional cloud chamber with Xe-filling, would be a very useful instrument.

Hagedorn reported on the state of the theoretical calculations on the production of antiprotons which had been started in the summer. These calculations which originally were thought to be rather simple, had proved quite lengthy and still could not be trusted even within a factor of 10. It was considered that the experimental results from cosmic rays at high energies and the results with the Bevatron at lower energies, would, together with the theoretical predictions, provide the basis for a reasonable prediction in our energy region.

Concerning the immediate programme it was decided to select for future study experiments 2 and 3, concerned with π -p-interactions ^{a working group composed} of Hagedorn, Hine, de Raad, Tollestrup, Merrison and Bridge was appointed to study the problem of the production of pions of 5, 10 and 20 GeV/c at an internal target and its collimation. The analysis of the beam was to be studied by another group consisting of von Dardel, Merrison, Lundby and Citron. Peyrou and Goldschmidt-Clermont were to investigate experiment 3 from the point of view of beam requirements, bubble chamber and data handling. The analysis of the particles resulting from the pion-proton interactions in experiment 2 would be the subject of a later study.

The groups mentioned above were to meet on Thursday December 5 at 14 p.m. to discuss the results. A meeting of the full committee should be held the following week.

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G.von Dardel.