CONCLUDING REMARKS

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In attempting to sum up the conference I feel in the same difficulty as the contemporary historian—events are so recent that it is difficult to get them into perspective, and to be sure which will ultimately turn out to be the most significant.

I can confidently say, however, that we have had our fair share of excellent papers of all types; first, interesting new ideas, including a sprinkling of those somewhat futuristic concepts which add colour to any conference. Second, reports of real progress in the understanding of the subtleties of cyclotron behaviour, backed in some cases by very beautiful and elegant experiments; third, we have heard some well presented authoritative reviews on the state of the art and future plans throughout the world.

Interest in the papers has been indicated by the low value of the exponent in the 'audience' vs 'time' curve, particularly gratifying in a town with as many tourist attractions as Oxford.

There is one important topic which has been hardly mentioned, though I expect it to figure more in future conferences. This is the rather sordid subject of costs and economics, which these days loom large in all fields of scientific endeavour.

Although new inventions provide simpler ways of doing things, the things that people want to do become more complicated and the net effect is a steadily increasing cost. One cannot, except retrospectively, measure the value of a piece of physics though one suspects that the new knowledge and understanding gained per pound spent can all too easily become a steadily decreasing function of time.

In this connection it is gratifying to see the increasing use of cyclotrons in fields other than nuclear physics where the demands are not yet at least so stringent. The session on compact cyclotrons, and the very existence of next week's conference (on the use of Cyclotrons in Chemistry, Metallurgy, and Biology) are an indication of these trends, referred to by Dr. Marshall in his opening speech.

Returning now to the role of historian, I glanced this morning once again at the proceedings of the first in this series of conferences, held just over 10 years ago at Sea Island. The first paper in the original volume is by Professor Richardson, entitled 'A Simplified Approach'. This is something we should consider seriously again at this time; we must ensure that designs and concepts do not become so complex that only a limited number of connoisseurs understand them.

At the time of the first conference only the Delft AVF cyclotron had operated, though already the remarkable electron models built by Berkeley and announced in 1955 had pointed the way to things to come. (Incidentally I think our small model at Harwell was the first spiral ridge machine to operate. However, we didn't

feel inclined to make any claim about this since it was so small that it would probably have worked just as well without the ridges!)

In that volume also is a paper by Ted Welton. His contribution plus that of the MURA group in getting computer codes established should not be forgotten.

The second conference, in 1962, saw the first report of Axial Injection by Powell, and H^- acceleration by the Colorado group. Also reported was the beautiful experiment on the Oak Ridge electron model which showed what really could be done if enough care was taken with tolerances and stability. Incidentally it was the subject of an early and successful conversion project, being elegantly converted into two coffee tables.

The CERN conference in 1963 had interesting reports on the initial operation of a number of important machines, and specifically included discussion of meson factories of all sorts, including the first plans for the ETH project, and F. M. Russell's beehive accelerator, the first version of SOC.

Before concluding, I should like to thank all those behind the scenes, as well as in the office, aisles and projection box who have worked so hard, at times in face of some difficulties, to make this conference a success.

I should like also to thank you all for coming and contributing such a wealth of papers, we had a hard task deciding which ones not to read.

Finally, I have to announce that the committee has recommended that the next conference should be held in Vancouver, in 1972.

Professor Hagedoorn (Eindhoven Technological University) then thanked the Director of AERE, the Head of Chemistry Division, and the Organisers for holding the Conference, and delegates dispersed at 6 p.m., 19th September.