

about the need for social control to prevent the abuses of traditional "liberalism". The difference is, perhaps, that now that the threat is biological, it is not merely the poor or the weak who are in danger, but even the rich and the powerful; just as, a century ago, it was only when cholera and other diseases refused to stay in the poor quarters of the cities of Britain, but also threatened those in grand houses, that some elementary sanitary and social improvements were begun.

Of course, we need freedom within the world's social control. We also need flexibility, an acceptance of change, while preserving stability, that is, we require a system with control and feedback mechanisms which will keep it on its course while it is bombarded by new influences. We need to do all this while preserving the popular right to choose one's government, while maintaining free trade as far as possible, peace along the frontiers and prosperity even in the poor countries.

The book contains no blueprint for any of these, just hints, at best, on some of the most likely approaches. But at least the questions are the right ones, and the success with which Sir Geoffrey has overcome his own Victorian ideals to take account of changes in the world around him might serve as a model for men much younger than he.

SIDNEY POLLARD

## Dating the Past

*The Impact of the Natural Sciences on Archaeology.* (A Joint Symposium of the Royal Society and the British Academy, organized by a committee under the chairmanship of T. E. Allibone, FRS.) Pp. vii + 185 + 3 plates. Published for the British Academy by Oxford University: London, January 1970.) 120s.

IN 1968, the officers of the Royal Society and the British Academy decided that, for the first time, these two bodies should work together in furthering knowledge in fields of common interest. The first fruit of this welcome decision was a joint symposium, and inevitably archaeology—the most obvious bridge subject between the natural sciences and the humanities—was selected as its subject. This handsome volume contains the papers presented on that occasion. (A paperback version, perhaps more modestly priced, constitutes a volume in Series A of the *Philosophical Transactions of the Royal Society*<sup>1</sup>.)

The symposium marked the 20th anniversary of the invention of radiocarbon dating and the first seven papers, beginning with a useful and readable review article by Willard F. Libby, are devoted to this topic. Perhaps a little of the symposium's thunder was stolen by the twelfth Nobel

Symposium on "Radioactive Variations and Absolute Chronology", held at Uppsala only four months previously, when the scientific problems relating to <sup>14</sup>C were discussed in greater technical detail. But the object of the London symposium was not the same, and this book is an attempt to bridge the gap which too often separates the archaeologist and his scientific colleagues. In general, because most of the contributors were at pains above all to be lucid, it succeeds admirably.

The chapters on dating include a beautifully concise survey of Egyptian calendrical chronology by I. E. S. Edwards, and the first publication by him and by Rainer Berger of the determinations made in the radiocarbon laboratories of the British Museum and the University of California at Los Angeles. The dates, from early contexts specially selected by Geoffrey Martin, tie in fairly well with the new tree ring calibration of radiocarbon. Sir Harry Godwin contributes a useful survey of the radiocarbon chronology of prehistoric Britain, and the picture is enlarged by chapters on thermoluminescent dating and on changes in the Earth's magnetic field intensity. All this gives the most convenient summary available of the present position in the field of scientific dating. At a time when the bristlecone pine calibration of radiocarbon dating is exciting so much interest, however, papers specifically on bristlecone pine dendrochronology and the resulting calibration would have been very welcome. Indeed, two of the people most suitable to give them, Bryant Bannister and Hans E. Suess, were apparently present at the meeting, the latter contributing a very brief but illuminating intervention published in this volume.

The truly heartening thought provoked by these papers, which include considerations of archaeological prospecting and of the various analytical techniques available for the examination of artefacts, is that archaeological technology today really has grown beyond the development stage. Indeed, second generation techniques are now replacing the exploratory demonstration of basic principles. Radiocarbon dates can be calibrated, fine grain and inclusion dating techniques in thermoluminescence replace the simpler holistic approach to pottery dating, and progress in archaeological surveying now comes primarily from improvements in the software of data processing techniques rather than from the hardware of the basic instrumentation.

Inescapably perhaps (or is it so inevitable?) the running seems to be made by the natural sciences—only four professional archaeologists contribute to the volume as against thirteen scientists, and two of these four write about methods and techniques of investigation rather than their results. The symposium was

thus really about methods for archaeology, not results in archaeology.

This does not, however, mean that the book is of interest only to the archaeologist. For the high calibre of the scientific contributors shows, above all, that archaeology really has taken its place in the scientific community as a recognized and valid subject of inquiry, a field for serious and sustained research and not merely a harmless and diverting hobby for research workers in their lighter moments. The dedicated professionalism of the work here, and the recognition accorded it by our two principal learned societies, promises well for the future.

The book lacks an index, and, more seriously, some of the contributors were evidently not asked to supplement their papers with bibliographical references. These defects apart, this volume is an altogether fitting monument to a historic occasion, and a gratifying demonstration of the high quality of scientific collaboration which archaeology can now attract.

COLIN RENFREW

<sup>1</sup> *Phil. Trans. Roy. Soc. A.*, 269, 1 (1970).

## Giants in Alliance

*Imperial Chemical Industries: a History.* Volume 1: The Forerunners 1870-1926. By W. J. Reader. Pp. xvi + 563 + 38 plates. (Oxford University: London, October 1970.) 120s.

*Anatomy of a Merger: a History of GEC, AEI and English Electric.* By Robert Jones and Oliver Marriott. Pp. 346 + 23 illustrations. (Cape: London, October 1970.) 75s.

MERGERS and amalgamations were a common feature of British industrial history in the inter-war years. Neither the causes nor the consequences, particularly the latter, have been thoroughly investigated to date, though one can easily speculate on the forces which prompted firms to merge their interests—sagging profits, excess capacity and increasing competition. When one turns to individual case histories such generalizations often fail to do justice to the complex influences at work, though in the case of both chemicals and electrical products one factor, namely foreign competitive strength, appears to have exerted considerable pressure in the 1920s and early 1930s. The formation of ICI in 1926 might be seen as the logical culmination of the steady concentration of control in the chemical field in the previous half century, but in fact it was probably the emergence of the great German chemical combine, IG Farbenindustrie, which sparked off the need to produce a united British front. McGowan of Nobel Industries was the chief instigator of the all British combine as the answer to the Germans, though at one point there was a strong likelihood of British links with the IG group.