choose their recruits partly by criteria other than scientific merit. It is then an entirely open question, left as such by Blume, whether this arrangement is the best possible. The reader may, if he wishes, draw the further conclusion that the government of science is ripe for political reform.

It would be misleading to represent the book as structured tightly around this particular polemical thesis. Rather, there is a broad survey, extending into such unaccustomed fields as unionisation and 'politicisation', but everywhere considering science as one institution among many, whose functioning involves 'politics' in every sense of the term. Even where Blume deals with topics traditionally considered as 'internal' to the scientific community, as organisations and 'social control', he unromantically invokes relations of status, authority and power as the basic explanatory principles. The material on "scientists and government" presents few methodological problems.

Oddly enough the concluding chapter on "innovation and society" rings slightly off-true. The case study here, fluoridisation, is of great systematic interest for the sociology of knowledge and control; but it is somewhat outside the main trend of the book, if nothing else than because the 'science' involved is medical (which remains peculiarly remote, intellectually and socially, from the central physical sciences). It may be that in spite of his sympathetic treatment of radical science groups, Blume has missed one crucial feature of the present connection between science and the lay public. This is the major part played by non-scientists, notably critical journalists, who muckrake establishment technology from the social and environmental points of view. Even if their excesses of zeal and haste do occasionally produce errors of fact and method even greater than those of their technically qualified opponents, they are now a permanent part of the scientific scene. Their influence on present recruits to science is not to be overlooked.

Considering this book as a contribution within the sociology of science, we may see it as opening a new phase, a final liberation from the Mertonian paradigm. Being empirical political sociology, it inevitably changes the terms of the debate away from models of a 'scientific community' towards an examination of a quasi-profession that depends on the state and industry for its existence. Sociologists of science no longer need to be tough-minded in demythologising 'science'; the simple facts of life about this sector of production render myths, models and ethos equally irrelevant.

It will be very interesting to see whether there is an effective reaction

against this tendency. If not, we can mark one of the most important changes in the political sociology of science viewed historically. For the ideology of science which (*pace* Blume) has a significant history extending back a couple of centuries, is built into beliefs and practices of many other spheres of activity; the term 'social science' can indicate this. An impairment of the functions performed by that ideology, within science as well as externally, will produce new phenomena quite as interesting as any studied in this present excellent survey.

J. R. RAVETZ

First map of the Moon

Thomas Harriot: Renaissance Scientist. Edited by John W. Shirley. Pp. x+181+4 plates. (Clarendon: Oxford; Oxford University: London, June 1974.) £6.50.

THIS book consists of seven varied essays, which are based on papers read at a symposium held at the University of Delaware on 5-7 April 1971. The editor explains in his preface why we should take an interest in Thomas Harriot (1560-1621): "Though recognised by his contemporaries as England's most profound mathematician, most imaginative and methodical experimental scientist, and first of all Englishmen to make a telescope and turn it on the heavens, Harriot had not prepared his work for future generations". This neglect of self-advertisement was doubtless produced partly by the superstitions of the age that could pillory an astronomer, and partly by the need to keep as state secrets the new techniques in instrumental navigation, the means by which England might survive economically. He did publish, in 1588, his account of a trip with Raleigh to Virginia, and is consequently now known among historians on both sides of the Atlantic as a pioneer, natural historian, ethnographer, and as one who made a systematic study of the Algonquian language. But, as a scientist, he is still the Cheshire Cat's grin.

It becomes apparent that Harriot knew the sine law of refraction before Snel and Descartes, and was the first man to draw a Moon map with the aid of a telescope. His earliest known telescopic observation of the Moon, on July 26, 1609 (OS) at 9 p.m., was made nearly three weeks before Galileo presented his telescope to the Venetian Senate, of which instrument Harriot could have had no knowledge whatever. Again, he may be given priority in the telescopic observation of sunspots, first recorded on December 8, 1610.

The trouble comes when one assesses the significance of Harriot in the history of science. As his pupil and friend Sir William Lower wrote on February 6 1610: "yet too great reservedness hath robbed you of those glories . . . it is possible by too much procrastination to be prevented in the honour of some of your rarest inventions and speculations. Let your country and friends enjoy the comforts they would have in the true and great honour you would purchase yourself by publishing some of your choice works". In this connection, Dr North, in chapter 7, reminds us of Arago's "règle aux historiens des sciences", which was public utility, implying prompt publication. There is no doubt, however, that Harriot contributed to new techniques in navigation and in the training of navigators.

The present volume contains: Professor Rosen on the intellectual background; Professor Shirley on Harriot's service with Raleigh; Professor Quinn on the Virginian expedition; Dr Pepper's highly technical paper on mathematical navigation; Dr Tanner on associates of Harriot, with a gratuitous attack on Henry Stevens (1819-86) who found Harriot's will; Professor Jacquot on the new natural philosophy; Dr North on Harriot's ten telescopes and the earliest observations made with them. These papers show the signs of their symposium origin. The same quotation may appear in different essays, and the references at the ends of the chapters (difficult of access here, why not have them in the proper place at the foot of the page?) and modes of citation are not made completely uniform. The nine-page bibliography lists the primary and secondary manuscripts, books published around Harriot's time, and modern studies relating directly or tenuously to Harriot. The Clarendon Press should have been more careful over consistency in the references (*ibid.* is in italic or roman; journal volume numbers are in arabic or roman), in ensuring that the "selective" index always led to the correct page, that the plate captions were properly positioned, and that type had not slipped.

As Professor Shirley explains, the study of the contemporary evidence, household accounts of the Northumberland, the public records, the Harriot manuscripts, has not been completed. This book of essays is, then, an expensive trailer for the main feature still to be shot. One can query the value of publishing this collection in book form, thus giving it permanence. What is needed first is a detailed description and assessment of the Harriot manuscript material. Only when this was been done can his significance be evaluated.

G. L'E. TURNER