search and development in some of the areas suggested has been initiated. Much work is now being done on solar and geothermal power, and a beginning is being made on analyses of the relations between energy use, economics and quality-of-life. Yet, in the final words of the seventh and last informational bulletin issued by the Energy Policy Project staff, taken from *A Time To Choose:*

"... the scope of potential energy savings and the benefits of slower energy growth have not yet received their just due in the national energy debate."

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Spectrophysics

A. P. Thorne
402 pp. Halsted, New York, 1974
$19.75 hardcover, $11.95 paperback

This is a well-written book mostly about experimental methods of spectroscopy as seen from a university laboratory. It will be useful to graduate students who are to use the techniques in their experimental work and to physicists and engineers who apply them in part of their work. The emphasis is on determination of atomic and molecular structure. It will also be useful to workers who apply spectroscopic techniques in field measurements, but they will find they need to supplement the discussions of noise mechanisms, time and bandwidth. The range is very broad—from the ultraviolet to microwave spectroscopy and from echelles to Fourier-transform spectroscopy (but not Hadamard techniques). The treatment seems strongest in the ultraviolet and visible; descriptions of infrared sources and detectors are quite minimal and the concept of specific detectivity is not even mentioned. Modern infrared photon detectors are not usually limited by current noise. The noise-equivalent power of photoconductors is much less than that of thermal detectors, but the price of this performance is cooling and variation of responsivity with wavelength.

Most of the book is clearly written and lucid. There is, however, a long chapter at the beginning summarizing the quantum mechanics of atomic and molecular structure, which is written in the old tradition of Oxford and Cambridge textbooks, containing much densely packed truth in a form resistant to access by the reader unless he knows it already. Students are advised to skip those 65 pages in favor of a more deliberate book and go on to the excellent treatments of instruments, line parameters, and emission from gases, which can teach them both details and a perspective.

JOHN A. JAMIESON
Washington, D.C.

H. G. J. Moseley: The Life and Letters of an English Physicist

J. L. Heilbron
325 pp. U. of California Press, Berkeley, 1973. $15.00

It is a distinct pleasure to recommend this biography warmly to a broad spectrum of readers. The work is an example of a rarity: a book that is just what its purports to be—H. G. J. Moseley's life and letters.

In the first half John Heilbron deftly describes, with remarkable balance, the historical development of the various contexts in which we find Moseley and the meaning of both his work and the scientific context it changed. For example, in the first four chapters, he interweaves just enough illustration to make convincing his rather outrageous suggestion in the preface: "... it almost appears that the chief joint objective of British scientists and educational reformers of the nineteenth century was to smooth the path of Harry Moseley." Similarly, before we follow Moseley from the scientific backwater of Oxford to the physical laboratories of the University of Manchester, Heilbron makes us painfully aware of Moseley's limited options. The tradition of a lively interest in and support of physics at Manchester, cultivated for two decades by Arthur Schuster and later by Ernest Rutherford, was a godsend for Moseley.

There was stimulation and excitement enough for him during his three-year intimate involvement in this research community which, adroitly led by Rutherford, stood poised at the frontier of the new physics, confident of its point of view, choice of problems and methods of solution. Near the end of this stay, Moseley was able (in collaboration with C. G. Darwin) to play leapfrog with the Braggs on the latter's home field of x rays, when he focussed his forces on the elucidation of the transcending Manchester problem: the structure of the atom. His monumental investigation of the elements by means of x-ray spectra, begun at Manchester, was completed at Oxford, after he decided he had accomplished all that he had hoped for at Manchester. His choice of Oxford was not entirely free, however. He supposed that there was a lack of adequate research facilities on the continent, and he felt a prejudice against French and German researchers. These reasons kept him from working abroad and the choice to stay particularly at Oxford stems largely

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H. G. J. Moseley is shown here in the Balliol–Trinity Laboratory, approximately 1910. John Heilbron notes, "... it almost appears that the chief joint objective of British scientists and educational reformers of the nineteenth century was to smooth the path of Harry Moseley."