Book Reviews

Sir Richard Gregory, His Life and Work. W. H. G. Armytage. Macmillan, London; St. Martin's Press, New York, 1957. 241 pp. $5.

The reputation of *Nature* was largely built by Richard Gregory. From 1893 to 1939, first as assistant editor and then as editor, he selected and solicited the material that has made *Nature* the world's most highly respected scientific journal. But more important, he wrote. It was Gregory who started the "leaders," or leading editorials, that have long been one of *Nature's* most important and influential features, and it was Gregory who for years wrote most of those leaders.

Great editors are, almost by definition, great crusaders. Gregory was such an editor. His creed was science, scientific humanism, the progress of society, and the application of the forces of science in the cause of human advancement. A long, enthusiastic, and vigorous life (1864 to 1952) was devoted to the furtherance of that program of science in the service of society. His weapons were the public platform, the committee, from time to time the organization of a special conference, sometimes the creation of a new organization (the British Science Guild, the Parliamentary and Science Committee, the Scientific Advisory Committee of the Trades Union Congress, a new section and a new division of the British Association for the Advancement of Science), and always *Nature*.

Emphasis on the editorship of *Nature* and the crusade to make science a more effective participant in the advancement of human welfare is proper, but may hide other facets of a life that would have been counted a success without these primary activities. In many respects, Gregory's life was a Horatio Alger story, but with the unusual aspect that his father—a poorly paid cobbler all his life—was also one of the influential early leaders of the labor movement, the author of several books of poetry, and the recipient of an honorary degree from the University of Bristol.

After a few years of school and odd jobs, Gregory became an apprentice shoemaker, a voracious reader, and a night-school student. These after-hours activities led to appointment as a laboratory assistant to A. M. Worthington at Clifton College and put him on the road to his career. A scholarship to the newly established Royal College of Science, at South Kensington, provided preparation for appointment as a science teacher and established the basis for a lifelong friendship and collaboration with his fellow-student, H. G. Wells. After a few years of successful teaching he was appointed, in 1889, assistant to Sir Norman Lockyer, an astronomer and the first editor of *Nature*. Four years later Lockyer appointed Gregory to the staff of *Nature*. But *Nature* never absorbed all of Gregory's writing and editorial energies. From his busy pen came original editions and careful revisions of nearly a score of texts and other books. As science editor for Macmillan, he edited more than 200 science books. From its founding in 1898 until 1938, he edited the *School World* (which became the *Journal of Education* in 1919).

Armytage's biography is a sympathetic and admiring account of the life of a remarkable and admirable man.

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Scientific Uses of Earth Satellites. James A. Van Allen, Ed. University of Michigan Press, Ann Arbor, 1956. x + 316 pp. Illus. $10.

Scientific Uses of Earth Satellites is an unusual type of scientific book. It is probably the first really comprehensive treatment of the subject of scientific experimentation with artificial earth satellites. But this is not what makes it so unusual. It is unusual because it is written before the fact. Usually, a researcher carries out his experiment, then checks his results carefully for internal consistency, accuracy, and validity before he ventures to present them to the scientific public. In the present book, however, one finds a wide variety of satellite experiments described and analyzed before any satellite has been launched.

There is, however, a good reason for this preview of possible satellite experiments. The cost of each experiment will be so very great that to do the very best that can be done is absolutely imperative. Perhaps the most effective way of insuring maximum return for the investment is to enlist the thinking of as many scientists as possible. To this end, the Upper Atmosphere Rocket Research Panel devoted its tenth anniversary meeting, which was held at the University of Michigan in January 1956, to a review of specific, detailed proposals for experiments to be performed in scientific satellites of the earth. The present book is a compilation of some of the papers that were presented at this highly stimulating meeting.

The subject of orbits and their determination receives considerable attention in the book. In the first two chapters, F. L. Whipple, R. J. Davis, and J. B. Zirker, of Harvard College Observatory, discuss the principal features of the orbit of a satellite that is close to the earth and the time that will be available for observing such a satellite optically. The authors give quantitative estimates of the changes in orbital parameters (such as the semimajor axis, perigee and apogee heights, eccentricity, inclination to the equator, and period of revolution) that will be produced by specified changes in initial height, geographic position, speed, and direction of motion. The relationship of these considerations to the problems of guidance and propulsion in the satellite-launching vehicle is obvious. In addition, the authors discuss the perturbations that will be caused by the oblateness of the earth and by atmospheric drag. Careful observation of these effects will permit a determination of the oblateness, on the one hand, and of the atmospheric density, on the other. This subject also receives attention from J. L. Sedwick, Jr., of the Ballistics Research Laboratories, Aberdeen Proving Ground, Maryland.

In the matter of observing the satellite optically, Whipple and his colleagues decide that a specularly reflecting satellite has a slight advantage over one that reflects sunlight diffusely and that, in either case, the total time available for observing the object during a specific passage is never more than a matter of minutes and is sometimes only a fraction of a minute.

H. J. Merrill, of the Signal Corps Engineering Laboratories, considers the tracking of a satellite by electronic optical means. It is desirable to track the satellite optically because of the high precision that can be obtained. By means of electronic techniques, improvement over the customary visual and photographic methods can be obtained. These improvements include superior time constants and the elimination of background. In addition, one can choose the optimum spectral region in which to work.