

**MAX PLANCK**, Scientific Autobiography and Other Papers.

Philosophical Library, N.Y., \$3.75

*Reviewed by Paul S. Epstein  
Professor of Theoretical Physics*

**T**HE FAMOUS GERMAN physicist Max Planck died in the fall of 1947 at the ripe age of 92. During the last two years of his life

he wrote several papers intended for the general reader which are collected in the present volume.

Planck's scientific career was rather unusual. As early as 1892 he had been appointed professor of theoretical physics at the Berlin University and had thus attained the highest position in the German academic world open to men of his specialty. But he admits himself that his influence on the development of physics in his country was almost nil. Being of a lonely turn of mind, he devoted his interests to the out-of-the-way subject of thermodynamics and let slip past him the two great creations of nineteenth century physics: the electromagnetic and the kinetic theories of matter. He was, therefore, completely overshadowed by the exponents of these two problems, his great contemporaries Heinrich Hertz and Ludwig Boltzmann. To make matters worse, he had the mortification to discover that even his thermodynamical results were not new but had been anticipated, many years earlier and in greater generality, by the American Josiah W. Gibbs.

Nevertheless, Planck labored on undaunted, and about the turn of the century his work led to unexpected results. His investigation of the thermodynamics of heat radiation led him to the discovery of the *quantum of action*, which opened up never-dreamed-of new vistas of scientific insight. Thus, the man who had been considered a sound but backward physicist in the nineteenth century, became the founder and leader of the new physics of the twentieth century.

In the essay entitled "A Scientific Autobiography" Planck writes with quiet dignity about his frustrations and with modest restraint about his great achievement. The reader gets the impression of a noble personality dispassionately pursuing his lonely way. Only rarely a bitter remark reveals the depth of his early disappointments, as for instance: "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."

The other papers are mostly devoted to problems in which modern

physics touches upon philosophy. They show that even in his very advanced age the author was fully abreast of the latest developments. Of particular interest are his views on "Religion and Natural Science." Planck grew up in a religious atmosphere, being the son and grandson of noted Protestant theologians. In his later life he lost the naive faith in miracles but retained the ethical outlook of religion: a strongly developed sense of duty and of moral purpose. He feels that mankind needs a great common ideology, a common belief through which men should become aware of their inherent brotherhood, and which should establish mutual love and peace on earth. It is doubtful, however, whether his own world view—a somewhat abstract pantheism—would be suitable to serve as this unifying ideal.

As an introduction the volume contains the memorial address read at Planck's funeral by Max von Laue, his pupil and life-long friend.

## ROUTE SURVEYS

by Russell R. Skelton

McGraw-Hill, N.Y. 531 pp., \$4.50

*Reviewed by William W. Michael  
Associate Professor of  
Civil Engineering*

**M**R. SKELTON'S *Route Surveys* presents the subject in a comprehensive and informative manner.

The sample field notes on preliminary and location surveys are excellent examples of present day practice, and the text on curves—both simple and compound—with its illustrative problems covers this portion of the work in a satisfactory manner. The spiral curve has been presented in a way that is understandable and applicable on both railroads and highway location.

The chapter on construction surveys should be particularly useful to the student who has not had any practical experience on actual construction work. The tables are good, and the size and shape of the book lend to its usefulness in the field, making it fit snugly into the engineer's pocket or field bag. On the whole, the book should be well received both as a text and a reference for the party chief in the field.

## OUT OF MY LATER YEARS

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