after H. H. Turner's death eventually inherited his office as foreign secretary, his corner-seat in the front row at meetings and, it is fair to add, his place in the affections of the fellows. He used its *Monthly Notices* as the medium of publication for almost all his fundamental contributions to science. Thus his early papers on star-streaming appeared there; his initial papers on Cepheid pulsations in 1916 appeared there; and these led in turn to his beautiful theory of the radiative equilibrium of the stars, in which the flow of radiation was first recognized as a basic process in the transfer of energy in stellar interiors, and in which the mechanical pressure of radiation was first shown to be an important element in the mechanical equilibrium.

The steps by which Eddington successively uncovered the dependence of relative radiation pressure on molecular weight, the dependence of that on ionization, the importance of radiation pressure in perhaps fixing the order of magnitude of the masses of the stars, and the probable gaseous character (on his hypotheses) of the whole interior of a star, are among the most fascinating in the history of mathematical physics. They led in turn to his recognition of the mass-luminosity law obeyed indifferently by giant and dwarf stars, which, however unsatisfactory still in its theoretical aspects, is an important supplement to our methods of ascertaining stellar masses. These steps accomplished, he returned to the question of the *chemical* constitution of stellar interiors, concluding (with others) that they are mostly hydrogen; and he completed in various ways his theory of pulsating stars. Further, he was a pioneer in the study of diffuse matter in interstellar space.

Eddington was ever a fighter for his ideas, allowing of no compromise when he had considered a matter and properly made up his mind. Many astronomers still remember titanic debates at the Royal Astronomical Society in which Eddington was protagonist and supreme defender of his own views; he asked no quarter, and he gave none. I think that a time may come when some of Eddington's more provocative conclusions on stellar structure may have to be re-valued, and that Eddington sometimes closed his eyes to the possibility of alternative attitudes to some of the scientific questions of the day. But as one who, in spite of wrestling with Eddington in public and in private in scientific disagreement, maintained always the happiest and friendliest personal relations, I join with heart-aching sincerity in the universal grief among the astronomical fraternity for one taken from us so unexpectedly, for a leader whose writings have been such an inspiration to lovers of astronomy and astrophysics, and for a dear friend to, and encourager of, all that was gentle, and wise, and witty, and satisfying in the sciences of which he was the devoted servant. Truly he was a great man.

E. A. MILNE.

ALL physicists deplore in the death of Sir Arthur Eddington the passing of a great leader in their science, whose genius they acknowledge as freely as they admit, in many cases, their inability to follow him in his most daring and difficult advances. These particular advances, however, form only part of his life's work: certain of his most striking achievements are based upon bold and penetrating applications of simple physical conceptions to problems not contemplated when they were elaborated. Nuclei stripped of all their electrons—of their crinoline, as Sir Alfred Ewing termed it—are a simple corollary of the nuclear theory of the atom: the pressure of radiation, measured in the laboratory, had been invoked to explain the behaviour of the tails of comets. Eddington seized upon these conceptions and, combining them with the laws of gravitation, evolved a theory within the comprehension of the ordinary physicist, which explained beautifully the general features of stellar structure and stellar evolution. Bare nuclei, together with the electrons freed from their normal orbits, readily represent a gas of great density, such as was required to explain the compactness of the dark companion of Sirius and other white dwarfs. By bold imaginative conceptions of this kind, combined with technical mathematical powers of the highest order, Eddington made of the stellar universe a physics laboratory where somewhat extreme conditions prevailed, but nevertheless a physics laboratory.

His early work on relativity and his observations that established the bending of light in a gravitational field were likewise matters which appealed to every physicist. His later work on the connexion of the theories of relativity and quantum mechanics, which enabled him to relate the velocity-distance relation of the spiral nebulæ to the number of elementary particles in the universe, and his mysterious number 137, are hard matters for many of us, but we feel that it is impertinence to criticize that which we do not understand, when it comes from a master. Here are great attempts at the solution of great problems, made in a manner that commands respect and admiration.

Eddington was a man of extremely wide interests in physics. In 1920 he wrote for the Physical Society a report on the Relativity Theory of Gravitation, which met an urgent need, and he was president of the Physical Society during 1930–32. He took a very active interest in the doings of the Society, and his presidential address on "The Expanding Universe" will be long remembered. When in the chair he showed a surprising familiarity with almost every aspect of physics that came before the meeting.

Eddington's more popular works, such as "Stars and Atoms", had a wide appeal to all interested in physical science. Physicists rejoiced to see the esoteric delights of their subject exposed with such perception, daring and vivacity. The width of Eddington's reading was shown nowhere so clearly as in his quotations, always apposite, which were drawn from an astonishing variety of authors. To the book just cited is prefixed a most apt citation from the Swiss anatomist and physiologist Albrecht von Haller, whose poetical works cannot be familiar to most English men of science,

> "Ich häufe ungeheure Zahlen,
> Gebürge Millionen auf,
> Ich setze Zeit auf Zeit und Welt auf Welt zu Hauf",

and elsewhere Descartes, Lucretius, Omar Khayyam, H. G. Wells, Isaac Newton, Cardinal Newman, Lewis Carroll, Milton, Shakespeare and the Bible among others are called upon.

It can be seldom, if ever, that one who was a master of the most abstruse technicalities of scientific thought could have been able to express himself as lucidly, as charmingly and as individually as Eddington does in his more popular works. He had in him something of the prophet, but one with a very much more amiable and conciliatory style in his writings than that of most prophets.

E. N. DA C. ANDRADE.