Optical astronomy

Bernard Pagel

Sterne—Kosmos—Weltmodelle. (Erlebte Astronomie.) By O. Heckmann. Pp. 353. (Piper: München and Zürich, 1976.) DM36.

THIS book is a collection of essays by the most distinguished living German optical astronomer and theoretical cosmologist of what is now the older generation. Scientific and autobiographical material is combined to make an unusually lively and lucid account in non-technical (German) language of the developments in which he has played a leading role: cosmology, positional astronomy, star clusters, development of the Hamburg Observatory (of which he became Director in 1941 after a four-year interregnum due to reservations as to his acceptability by the Nazi authorities), and the foundation of the European Southern Observatory (ESO, of which he was the first Director General from 1962 until his retirement in 1969). There are also shorter articles, including an obituary of the great Walter Baade, a Presidential address on the 50th anniversary of the International Astronomical Union and some experiences that read like short stories.

In the section on cosmology (described with deceptive modesty as the author's 'hobby'), the most interesting chapter provides an account of the history of the subject, his own involvement therein, and its relationship to German politics in the Nazi era. In the face of the official and noisy campaign against "Jewish physics", Heckmann held seminars on special relativity and on cosmology in which he took pains to expose the futility of such distinctions; and in 1942 (by which time that campaign had lost some steam) he published an important monograph on *Theories of Cosmology* which gave clear expositions of Newtonian, general relativistic and kinematic cosmology, but nevertheless got past the censor (perhaps because its arrangement so clearly brought out the connections between them), earning international acclaim. After the war, Heckmann continued to make important contributions to the foundations of cosmology until deflected by the departure of his collaborator, E. Schücking, and his own involvement with ESO. He gives a very clear and thoughtful description, enlivened with personal experiences, of developments up to the present, together with further chapters on historical and philosophical aspects.

Heckmann's chief personal contributions to optical astronomy were in the study of open star clusters (largely in collaboration with H. Haffner), notably the precision colour-magnitude diagram

of Praesepe. The astrophysical significance and the enormous work involved in reaching a degree of accuracy unprecedented in 1937, are very well described, although in this case the absence of any diagrams from the book is a weakness. At Hamburg, clusters continued to be a major preoccupation; another was positional astronomy—completion of the AGK2 and launching of the AGK3, which now provides proper motions and spectral types for 180,000 stars. Situated 20 km east of the city centre, Hamburg Observatory emerged from the War almost unscathed, although there was a narrow escape in the final battles around Lüneburg. After the War its staff was enlarged and its facilities enhanced with an 80-cm Schmidt telescope originally planned in 1937 in the hope of attracting Baade; it took immense political skill to get renewed funding in 1948. Significant studies of galactic structure were carried out with this instrument in the late 1950s, but its usefulness was already becoming restricted by city lights; and it has now been moved to the new Spanish-German observatory near Almería.

The ESO project was suggested in 1953 by Baade as a means of redressing the balance both between the Northern and Southern Hemisphere and between US and European optical astronomy; to save time and money, direct copies of Californian telescopes were to be used. Governmental support was rapidly secured in Holland, Belgium, Sweden and West Germany, and later in France and Denmark; and the Ford Foundation contributed a million dollars. Progress was slow, however, until the 1960s when the site of La Silla in the Andes was finally adopted after extensive site-testing in South Africa and Chile. It now boasts a fine collection of instruments including a 3.6-m Ritchey-Chrétien, together with offices and laboratories in La Serena, Santiago and Geneva—a far cry from the quick project based on existing designs envisaged by Baade, but nevertheless a great achievement which owes much to the energy and foresight of its first Director-General.

Heckmann's book gives a rounded picture of a man who has served the scientific community well through his thoughtful intelligence, integrity and very considerable courage, together with outstanding scientific and international vision, applied with great administrative and diplomatic ability. It is well worth reading, also, as an authoritative and often engagingly frank account of some of the most important developments in cosmology and optical astronomy in recent years. □

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