

between NO_2 and either the solvent or impurities contained therein.

Radicals described as NH_3^- , C_2H_2^+ and allyl alcohol diradicals are without doubt other species than these, and the presence of a hyperfine splitting from ^{129}Xe in irradiated CF_4 is certainly surprising!

It would scarcely seem necessary to illustrate spectra for polycrystalline diphenylpicrylhydrazyl, or indeed for aqueous Mn^{2+} , but to find both these spectra referenced as "unpublished results" is quite astonishing.

M. C. R. SYMONS

SENSE OF PERSPECTIVE

The Graphic Work of M. C. Escher

Pp. 24 + 69 plates. (London: Oldbourne Book Co., Ltd., 1967.) 42s. net.

"ALTHOUGH I am absolutely innocent of training or knowledge in the exact sciences," Escher writes in the introduction to this book, "I often seem to have more in common with mathematicians than with my fellow artists." In the principles of symmetry, inversion and topology that so dominate his work, Escher shares a common interest, superficially at least, with chemists and crystallographers as well as with mathematicians. Yet scientists no less than others will wonder whether the intriguing visual paradoxes that Escher conjures forth from the formal qualities of line and plane in fact transcend their own virtuosity.

Escher's impossible buildings, achieved by subtle permutations of the rules of perspective, are among the best known of his works. A genre that he has made his own is the exact filling of a space with two or more sets of discrete objects which interlock perfectly with each other. Another common theme is the blending into one composition of two mutually incompatible situations. "Day and Night", for example, shows on the left hand black birds flying over a daytime landscape and on the right hand white birds flying over the mirror-image landscape under cover of darkness; the centre of the picture, with remarkable dexterity, merges the two flocks of birds into each other and into the contraposed landscapes.

But after the tricks and the *trompe-l'oeil*, what remains? Is there a serious substance in these drawings, or are they to be dismissed as amusing exercises in technique, no more significant than the visual illusions beloved of psychologists? Escher himself points out that two of his motifs were taken from an article in the *British Journal of Psychology*, and the bizarre naivety of the grinning fishes and dwarflike men that populate many of the drawings cannot but confirm the impression of frivolity.

Beneath the pyrotechnics there is, perhaps, a profounder purpose. Lévi-Strauss, possibly with tongue untypically in cheek, has remarked of abstract art that it is concerned with style, not content, and that an abstract work shows the manner in which the artist would execute his pictures if he were by chance to paint any. In a similar way it seems that Escher is preoccupied with the conventions of representing three dimensions in two, and that his pictures are inquiries into the logic of perspective and the assumptions made both by the hand of the artist and the eye of the beholder. Escher says in his notes on the pictures, "The two dimensional is every bit as fictitious as the four dimensional, for nothing is flat". His work is an exploration of the absurdities that spring from this fiction and, it may seem, is a statement of the problems to be overcome before he could himself portray the world as he sees it. The plates grouped under the heading "Conflict between the Flat and the Spatial" are a remarkable and not merely entertaining exposition of these absurdities.

At two guineas this book is moderately priced, and to those who decline to accept it as art, its illusions should give a good run for their money.

N. M. L. WADE

OBITUARIES

Professor J. L. B. Smith

PROFESSOR J. L. B. SMITH, the South African ichthyologist, died at his home in Grahamstown on January 7, 1968. At the time of his death he held the research professorship of ichthyology at Rhodes University.

Professor Smith's name will always be associated with the discovery and description of the extant coelacanth crossopterygian, *Latimeria chalumnae*, captured in December 1938 near East London. The circumstances surrounding this event, and the subsequent fourteen-year-long campaign to obtain a second specimen, were vividly described by Smith in his book *Old Fourlegs* (1956). This account revealed (as its author realized) a great deal of the man, and rarely can have been equalled as a frank character-study of a determined and dedicated man.

Born at Graaff Reinet in 1897, Professor Smith was educated at a number of schools including "Bishops" College, and the Victoria College, Stellenbosch. It was at Stellenbosch that his interest in chemistry was first aroused, and it was as a chemist that he joined Rhodes University College, Grahamstown, as a lecturer in 1923, after obtaining a Ph.D at Cambridge. During the First World War, Smith served with the South African Forces in East Africa.

From 1923 until 1947 Smith lectured in chemistry at Rhodes, producing several papers and three textbooks on chemical subjects. His spare time, however, was largely devoted to studying fishes. It was during this period that, in addition to his work on the anatomy of *Latimeria*, he laid the foundations for his most widely known work, *The Sea Fishes of Southern Africa*. In 1947, the South African Council for Scientific and Industrial Research awarded Smith a research fellowship which enabled him to resign his post in the chemistry department and thereby devote his full energies to ichthyology.

Smith's interest in fishes stemmed from an early contact with them as a sea-angler. This introduction left its mark on all his subsequent work which, as far as possible, he based on personal acquaintance with the fishes in the field. His love and enthusiasm for angling, and his appreciation of the angler's problems, led Smith into wide and profitable contact with the public. There is probably no other ichthyologist who can claim to have had queues forming outside bookshops on the day his regional monograph was published. Yet this was the reception that Smith's great work *The Sea Fishes of Southern Africa* received in 1949.

Essentially synoptic in its treatment, *Sea Fishes* was followed by a series of family and generic revisions of species from South African waters and the western Indian Ocean, as well as numerous shorter papers dealing with new taxa. In 1963, Smith and his wife published another important regional synopsis, *Fishes of the Seychelles*, covering an area the marine fauna of which had received scant attention since the mid-nineteenth century. In all, Smith produced more than two hundred papers and articles on ichthyological subjects.

Although there is a long history of ichthyological research in South Africa, Smith's investigations have undoubtedly added more to our knowledge of the fishes from this vast marine area than have those of any of his predecessors. Smith's work was essentially pioneering, and his attitude that of a field-worker faced with the task of mapping a complex and rich fauna still imperfectly known. At times this brought him into conflict with European and American workers, particularly on questions of nomenclature. The momentary heat-haze generated by these differences cannot, however, obscure the fact that J. L. B. Smith's drive and dedication resulted in a very significant contribution to ichthyology.